



Political centralization in pre-colonial Africa

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ABSTRACT

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In this paper we investigate the empirical correlates of political centralization using data from the Standard Cross-Cultural Sample. We specifically investigate the explanatory power of the standard models of Eurasian state formation which emphasize the importance of high population density, inter-state warfare and trade as factors leading to political centralization. We find that while in the whole world sample these factors are indeed positively correlated with political centralization, this is not so in the African sub-sample. Indeed, none of the variables are statistically related to political centralization. We also provide evidence that political centralization, where it took place, was indeed associated with better public goods and development outcomes. We conclude that the evidence is quite consistent with the intellectual tradition initiated in social anthropology by Evans-Pritchard and Fortes in the 1940s which denied the utility of Eurasian models in explaining patterns of political centralization in Africa. *Journal of Comparative Economics* 41 (1) (2013) 6–21. Harvard University, John F. Kennedy School of Government, 79 John F. Kennedy Street, Cambridge, MA 02138, United States; Harvard University, Department of Government, IQSS, 1737 Cambridge Street N309, Cambridge, MA 01238, United States.

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1. Introduction

Most of the poor people in the world live in Sub-Saharan Africa (henceforth Africa). The income per-capita of the poorest countries such as Ethiopia or Sierra Leone differ from those of prosperous OECD countries by a factor of about 40 and these income differences come along with huge differences in welfare, health, economic opportunities and life chances. Two hundred and fifty years ago, before the ‘great divergence’ we know that these differences were much smaller. Parts of the world which have now very different levels of income per-capita were indistinguishable according to this metric in 1750. But how poor relatively was Africa compared to other parts of the world? Some, like Hopkins (1973), Thornton (1992), Jerven (2010) or Ehret (2012), see few historical differences in institutional dynamics and prosperity between Africa and the rest of the world. Others are more selective, arguing that while Africa may have been behind Eurasia it was ahead of the Americas (e.g. Inikori, 2012). Africa was certainly behind the rest of the world, even the Americas, technologically (Goody, 1971; Austen and Headrick, 1983; Law, 1980) and Acemoglu and Robinson (2010, 2012) argue that more generally it was economically

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backward in many dimensions at the start of the early modern period, and in particular did not have the economic and political institutions necessary to generate modern economic growth.

If one accepts that Africa lagged the rest of the world in term of developing basic economic institutions and public goods which might have stimulated technological change or adoption in the early modern period what might have been behind that? This question has been answered in many ways. [Easterly and Levine \(1997\)](#) argued that the great ethnic fragmentation of Africa was one reason for its relative poverty, [Sachs and Warner \(1997\)](#) suggested Africa had adverse geography, while [Inikori \(1992\) and Nunn \(2008\)](#), following a large literature in Africa studies, focused instead on the deleterious impact of the slave trade. Other scholars have instead emphasized more recent factors potentially causing poor economic performance in Africa, such as the arbitrary nature of post-colonial national boundaries ([Englebert, 2000](#)).

One thing that everyone seems to agree on is that state institutions have been dysfunctional in Africa. Much of the political science literature saw economic decline after independence as being closely related to states that were unable or unwilling to provide public services or encourage economic activity ([Callaghy, 1984; Turner and Young, 1985](#), on the totemic case of Zaire, [Young \(1994\)](#) for a synthesis). Moreover, the lack of effective centralized states is clearly a potential factor not just in explaining poor economic performance in Africa since 1960, but also over a much longer duree. Whatever the impact of the colonial period might have been on state formation in Africa, at a factual level the evidence seems to suggest that Africa developed centralized states later than the rest of the world. Though Africa certainly did have states and quite a few emerged and consolidated in the 18th and 19th century, this process seems to have definitely lagged behind Eurasia and at least parts of the Americas (Central America and Andean South America). One can get some quantitative picture of this via the data coded by Louis Putterman and his collaborators ([Bockstette et al., 2002](#)). [Fig. 1](#) plots their state antiquity index from 1000 to 1500. This captures the extent to which a country in the world has been under the control of a centralized state. It shows that though Africa did have greater state antiquity historically than the Americas or Oceania, it lagged behind the rest of the world, particularly Eurasia.

A large literature in social science places the functioning of the state at the heart of economic development. Ultimately this view comes from the work of Max Weber and recent comparative work has claimed that the difference between developmental successes and developmental failures is indeed that the former have effective states while the latter do not (see for example [Evans \(1995\)](#), or the recent literature by economists: [Acemoglu, 2005; Acemoglu et al., 2013, 2011; Besley and Persson, 2011](#)). In the context of Africa the most ambitious version of this argument is due to [Herbst \(2000\) and Bates \(2001\)](#). Indeed, as we discuss in Section 2, the case study literature in Africa does indeed suggest that the absence of centralized state authority is a potent source of poor economic institutions and the absence of public good provision, potentially helping to explain lagging economic development of Africa.

But what could explain the differential development of centralized states in Africa? This topic has been researched at least since the famous volume edited by the social anthropologists [Evans-Pritchard and Fortes \(1940\)](#) and has taken two broad lines. Many scholars, for example [Diamond \(1997\), Herbst \(2000\), Bates \(2001\) and Reid \(2012\)](#), take what they see as the successful models which have supposedly explained political centralization in Europe and apply them to Africa. Here the key would be the absence of the factors which led to the formation of states in Europe, usually warfare, high population density and trade. For example, factors unique to Africa such as a very adverse disease environment or lack of domesticable plant and animal species kept population density low which retarded the development of states. Other scholars, exemplified even by [Evans-Pritchard and Fortes \(1940\)](#) and more recently by the essays in [McIntosh \(1999a\)](#) particularly [McIntosh \(1999b\) and Vansina \(1999\)](#), deny the applicability of Eurasian model to explain the dynamics of political institutions in Africa. Their main point is that it is not simply that there is less political centralization in Africa, but that the development of

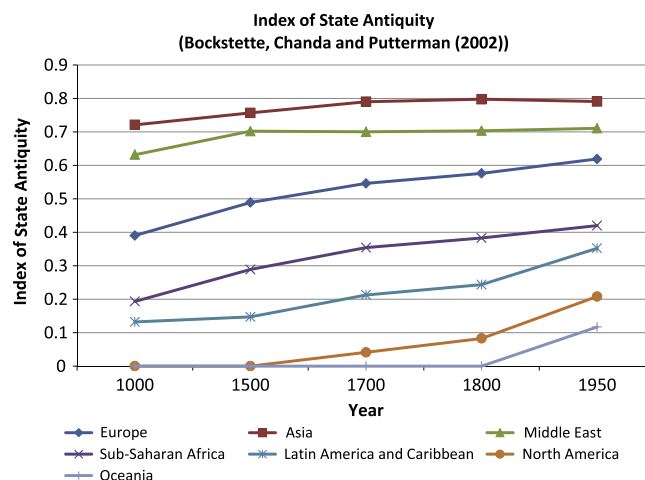


Fig. 1. Index of state antiquity (from [Bockstette et al. \(2002\)](#)).



Fig. 2. African ethnic groups (sub-Sahara) in SCCS dataset.

political institutions took a different path historically creating qualitatively very different structures from those seen in Eurasia.

Though the causal mechanisms linking population density, warfare and trade to political centralization may be widely regarded as plausible they suffer from many problems. Most obviously to our knowledge there have been only three empirical studies of the determinants of political centralization in Africa. Though it was not the focus of his research, [Nunn \(2008\)](#) found an important negative correlation between the intensity of the slave trade and political centralization. More recently, [Fenske \(2012\)](#) argues for a causal relationship between ecological diversity and state formation in Africa arguing that this picks up the potential for specialization and trade. [Alsan \(2012\)](#) shows that the incidence of tse-tse fly is negatively correlated with political centralization which she argues works through various channels, including lower population density and the inability to use draught animals. None of these papers uses the data we use in this paper or considers other potential hypotheses. Reflecting this lack of research there is also considerable controversy about what the basic correlations are. [Evans-Pritchard and Fortes \(1940\)](#) famously denied that there was any correlation between state formation and population density in Africa. Noting (p. 7).

“size of population should not be confused with density of population. There may be some relations between the degree of political development and the size of population, but it would be incorrect to suppose that governmental institutions are found in those societies with great density.”

This view was contested by [Stevenson \(1968\)](#), reaffirmed by [Vengroff \(1976\)](#), contested by [Bates \(1983\)](#), but recently reaffirmed once more by [McIntosh \(1999b\)](#), though none of these papers actually looked systematically at the most complete data available. Other issues, such as the connection between warfare and state formation in Africa seem never to have been systematically investigated. If the correlations are controversial, this must a fortiori be true about causal relationships. For example, even if it were true that there is a positive correlation between population density and state formation, this does not imply that higher density of populations make it more likely for states to form. It could well be the other way round. Indeed, much case study evidence from Africa suggests that state formation is followed by population expansion rather than the other way round.¹

¹ It turns out that this is quite a common feature of the historical record. For instance [Stanish \(2001\)](#) surveying research on the origins of the state in Latin America remarks (p. 58) “Population spikes tend to occur after state development, not before. The areas where states first developed have the greatest capacity for sustained demographic increase and the intensification of production” exactly as with the Kuba. Equally telling is [Vansina's \(2004\)](#) analysis of the institutional consequences of population expansion in Rwanda. These come in the 19th century after the state had been created in the 17th century and consolidated in the 18th. Looking at cross-sectional correlations between population density and political centralization therefore tells us nothing interesting about state formation.

In this paper we use the Standard Cross Cultural Sample to conduct some preliminary tests of the conventional hypotheses about the drivers of state formation in the whole world and Africa. This dataset was first constructed by [Murdock and White \(1969\)](#) using materials from the more frequently used Murdock Ethnographic Atlas, but covering far fewer “cultures”. The rough idea was that the societies in the Atlas were not independent cultures since many of them had common roots and were subject to cultural dissemination and contagion. The SCCS has been greatly added to over time by many different anthropologists and now includes 186 cultures. This is far fewer than the number of societies in the Atlas but unfortunately that dataset does not include most of the main explanatory variables in which we are interested. Though this dataset is less than ideal, and very incomplete since any variable usually has many missing observations, it does contain quite a lot of important variation in Africa both spatially and in terms of political centralization (see [Fig. 2](#)). For instance it includes the !Kung bushmen and the Hadza, two hunter–gatherer societies; a few classic unpolitically centralized societies in Africa, these include the Tallensi or Northern Ghana, the Kikuyu of Kenya and the Tiv of eastern Nigeria; it also includes some salient politically centralized societies such as the Asante of Ghana, the Ganda of Uganda, and the Hausa of Nigeria. Finally there are intermediate societies such as the Bemba of Zambia and the Mende on Sierra Leone. Nevertheless, it only includes 40 cultures in sub-Saharan Africa.²

Our findings are quite contrary to the existing literature which has stressed the applicability of Eurasian models of political centralization in Africa. Our initial examination of the data uses Ordinary Least Squares (OLSs) regressions and thus consists only of conditional correlations. However, we find that while for the whole world sample there is a very robust positive correlation between population density and political centralization and at least some evidence of a positive correlation between trade and warfare and political centralization, this is not so for the Africa sub-sample. Indeed, within Africa all of these potential explanatory variables are uncorrelated with political centralization. Though the sample size is small and these results should obviously be regarded as preliminary it is quite striking that the theories fail to predict the correlations in the data so completely.

We investigate this further by developing an identification strategy to cope with the potential endogeneity of population density. Since the SCCS contains a variable for the agricultural potential of the area inhabited by a particular society we use this as a potentially exogenous source of variation in population density. In the first stage there is a strong positive correlation between agricultural potential and population density in the world, though this is weaker in the African sub-samples. In the second stage our Two Stage Least Squares (2SLSs) results confirm our initial findings: there is a robust positive correlation between population density and political centralization in the whole world but not in Africa.

Finally, since the SCCS also includes various measures of public goods, particularly the use of money, writing and various modern forms of infrastructure such as roads, we can further use it to investigate whether the correlations are consistent with political centralization being important for development. We find very strong positive correlations between political centralization and all these public goods outcomes suggesting that the relative lack of political centralization in pre-colonial Africa may indeed be an important part of the story about African underdevelopment.

Though these results might be thought to be somewhat negative we feel they are an important test of the recent literature on the origins of the state in Africa. They suggest, as social anthropologists have long argued, that historical states in Africa were not only less centralized but developed according to different logics than the states of Eurasia. In consequence the presence or absence of the factors that created states in Eurasia are not relevant for determining the variation in political centralization in Africa. A different theoretical approach is required. One alternative which flows from the anthropological literature is that Africa differs from Eurasia in terms of social structure and this may be an important influence on political centralization. For example, the types of age structures and organizations common to many stateless societies in Africa (e.g. [Prins, 1953](#); [Bernardi, 1985](#)) may create cross-cutting cleavages which make it very difficult for one group to accumulate political power and build a state (see [McIntosh \(1999b\)](#) for related ideas). We are investigating these ideas in ongoing research ([Acemoglu et al., 2012](#)). Our argument is as follows. It is natural to think of a society lacking political centralization as divided into different relatively autonomous groups, often based on kinship. Put simply, political centralization involves one of these groups dominating the others and removing this autonomy. Though many things may influence the incentives and constraints which face a particular group attempting to dominate the others, we hypothesize that in Africa a significant important factor is the existence of cross-cutting cleavages which link groups together. There are many types of such institutions but the canonical example might be age sets the most famous definition of which is due to [Radcliffe-Brown \(1929, p. 21\)](#) as

“a recognised and sometimes organized group consisting of persons (often male persons only) who are of the same age .. In Africa, at any rate in East and South Africa, an age-set is normally formed of all those males who are initiated at one time ... Once a person enters a given age-set, whether at birth or initiation, he remains a member of the same age-set for the remainder of his life .. In East Africa, where the age-organization is highly elaborated, each age-set normally passes from one grade to another as a whole.”

But they also include many other types of institutions such as secret societies, cult groups, titling societies and various other types of associations. The hypothesis [Acemoglu et al. \(2012\)](#) is that it is unique elements of the social structures of African societies which make it very difficult to centralize power because they make it difficult for one group to dominate

² Using the SCCS dataset, we combine 28 ethnic groups listed in the Africa Region, with 12 other sub-Saharan groups listed under the Circum-Mediterranean region. See [Fig. 2](#).

others, a precondition for political centralization. Though this theme surfaces at many places in African studies to our knowledge it has not been precisely formulated before and tested. It dates back at least to a series of critiques of Evans-Pritchard and Fortes's dichotomy between state and non-state (lineage) societies. Brown (1951) challenged this on the basis that "associations" defined as "an organized and corporate group, membership in which does not follow automatically from birth or adoption into a kin or territorial unit" were critical links between lineages in many non-state societies, such as the Igbo or Tallensi in West Africa (a point made independently for East Africa by Bernardi (1952)). But she points out (p. 270) that "no associations were found in Ashanti, and that the associations of Dahomey and Nupe did not use sanctions against non-members". Strikingly, of all the places she studied, these were the ones that had centralized states. Similar issues arise in McIntosh's critique of the application of non-African models of political complexity to understanding the development of political institutions in Africa. She notes "The distribution of power among several corporate entities (e.g. lineages, secret societies, cults, age grades) can be regarded as a strategy that has successfully resisted in a variety of ways the consolidation of power by individuals" (1999b, p. 4). However, her emphasis is not on how these block the creation of political centralization but on how they create qualitatively different complex political organizations. In more specialized literature, particularly on East African stateless societies, there is a huge amount of emphasis on such cross-cutting institutions, particularly age-sets and the political role they play (e.g. Prins, 1953; Dyson-Hudson, 1963, 1966; Bernardi, 1985). At the same time in societies with states, such as the Buganda, the Basoga, or Rwanda there is often mention of the absence of these cross-cutting associations (e.g. Fallers (1964, 1965) on the former two and Vansina (2004) on the latter), but the comparative picture never seems to have been put together.

The paper proceeds as follows. In the next section we discuss the data we use in detail. In Section 3 we then explore the issue of whether polities with greater degrees of political centralization have better development, particular public goods, outcomes. This exploration is important for motivating our study of political centralization and it is interesting to undertake it with the SCCS. We also discuss some case study evidence that the lack of political centralization in Africa has been responsible for poor economic institutions and poor economic performance. In Section 4 we then turn to a very preliminary analysis of the basic hypotheses using OLS regressions. Section 4.2 then discusses our identification strategy for population density and provides our 2SLS estimates. Section 5 concludes.

2. The data

We now undertake a very preliminary investigation of some basic hypotheses about the determinants of political centralization using data from the Standard Cross-Cultural Sample (SCCS). The data can be downloaded free from the web site maintained by Douglas White at UC Irvine (<http://eclectic.ss.uci.edu/~drwhite/courses/index.html>).

2.1. Measure of political centralization

The main variable we use to capture political centralization is "Jurisdictional hierarchy beyond local community" (variable number 237 in the SCCS) since this is the variable which has previously been used in the economics literature to examine some of the consequences of political centralization in Africa (e.g., Gennaioli and Rainer, 2007; Michalopoulos and Papaioannou, 2011). This variable ranges from 1, indicating "No levels (no political authority beyond community)", through 2 (One level, e.g., petty chiefdoms), 3 (Two levels, e.g., larger chiefdoms), 4 (Three levels, e.g., states) to 5 (Four levels, e.g., large states).

We investigate the robustness of this by alternately using as the dependent variable 'Levels of Sovereignty' (variable 83 in SCCS) originally coded by Tuden and Marshall (1972). It ranges from 1 which indicates a stateless society (98 cases) up until 4 which indicates the number of layers of political hierarchy which can be identified (31 cases are coded as 2, 14 as 3, and 41 as 4). These variables are correlated at the level of 0.81 but as will be seen they give slightly different results.

2.2. Implications of centralization

We use various sorts of measures to examine the consequences of centralization. Though as we noted this is not the focus of the paper, it is nevertheless interesting as part of the puzzle of long-run African development. The SCCS sample has variables which measure public goods outcomes and some which are more closely tied to economic development.

For public goods we examine the variables

1. Market exchange within local community (SCCS variable 1733) (1 = no market exchange; 2 = market exchange within local community present; 3 = market exchange within local community present, involving local and regional products; 4 = market exchange within local community present, involving local, regional, and supra-regional products).
2. Types of land transport routes (SCCS variable 14) (1 = Unimproved Trails, 2 = Improved Trails, for porters or animal carriers, 3 = Unpaved Roads, for wheeled vehicles, 4 = Paved Roads).
3. Use of money as medium of exchange (SCCS variable 17) (1 = No media of exchange or money, 2 = Domestically usable articles as media of exchange, 3 = Tokens of conventional value as media of exchange, 4 = Foreign coinage or paper currency, 5 = Indigenous coinage or paper currency).

4. Presence of police service (SCCS variable 90) (1 = Not specialized; 2 = Incipient specialization; 3 = Retainers of chiefs; 4 = Military; 5 = Specialized).
5. Availability of writing and record-keeping (SCCS variable 149) (1 = None; 2 = Mnemonic devices; 3 = Nonwritten records; 4 = True writing; no records; 5 = True writing; records).

Larger values of any of these variables are naturally associated with greater provision of public goods, such as market exchange, roads, money, police and writing. Though of course to some extent these things could arise as the result of private initiative, the historical evidence suggests that as in Eurasia, the state played an important role in inducing and sustaining all these things in Africa.

For development outcomes we examined the following dependent variables:

1. Mode of land transport (SCCS variable 13) (1 = Human Carriers, 2 = Pack Animals, 3 = Draft Animals (sleds, travois), 4 = Animal Drawn Wheeled vehicles, 5 = Motorized vehicles).
2. Availability of credit (SCCS variable 18) (1 = Personal loans between friends or relatives; 2 = Internal money lending specialists; 3 = External money lending specialists; 4 = Banks or comparable institutions).
3. Metal smelting (SCCS variable 129) which we re-coded as a dummy = 1 if smelting was present = 0 otherwise.
4. Communal land (SCCS variable 1726) (1 = land predominantly private property; 2 = land partially communally used; 3 = communal land use rights only). We re-scaled this variable so that higher values refer to the availability of property rights in land.

2.3. Explanatory variables for centralization

We examine three main explanatory variables. The first is population density (SCCS variable 64) which is coded as ranging from 1 (less than 1 person per 5 square miles), 2 (1 person per 1–5 square miles), 3 (1–5 persons per square mile) all the way to 7 (over 500 persons per square mile).

The second is external or “inter-state/polity” warfare which we measure using the variable “Frequency of external warfare – being attacked” (SCCS variable 893) which seems to capture best the mechanisms leading from warfare to state formation which scholars have proposed.³ This variable is coded as follows 1 = Continual, 2 = Frequent, 3 = Infrequent and we re-coded it so that higher values correspond to more frequent warfare.

The third variable we use attempts to capture the extent of trade. It is clear that trade can precipitate political centralization with well known examples being in the Kathmandu Valley. In the African case this also looks to be a potentially very interesting mechanism since the states of the Niger bend in the Middle Ages such as Ghana, Mali and Songhay, have traditionally been seen as arising from the trans-Saharan trade (see [McIntosh, 2005](#)) (and the SCCS does include the Bambara in modern Mali and Songhay). Other states like Asante and Dahomey grew in West Africa on the basis of the slave trade. On the other hand, it is also true that states elsewhere, such as Buganda or Rwanda, emerged and grew in a much more autarkic environment. To capture trade we use the variable 1734 “Market exchange outside of local community” coded as 1 = no market exchange outside of local community, 2 = market exchange outside of local community (at trading posts, market places), 3 = market exchange outside of local community, involving local and regional products, 4 = market exchange outside of local community, involving local, regional, and supra-regional products.

Though these are our fundamental explanatory variables the SCCS database also allows us to investigate some other interesting hypotheses about political centralization. We focus on two. Though the literature which emphasizes the role of warfare on state formation has stressed the significance of inter-state warfare ([Tilly, 1975](#), being seminal) other scholars have stressed that internal wars, civil war or rebellions may be important for stimulating state formation and political centralization. An obvious case is 17th century Britain where the civil war of the 1640s and the Glorious Revolution of 1688 both led to significant developments in the state but were internal conflicts ([Brewer, 1988](#); [Braddick, 2000](#)). More recently [Slater \(2010\)](#) has argued for Southeast Asia that internal conflicts were critical in stimulating state formation in the post World War 2 period. We can investigate these ideas through two variables in the SCCS. The first is “Frequency of Internal War” (SCCS variable 891) ranging from 1 (Continual), 2 (Frequent) to 3 (Infrequent). We re-scaled this variable so that higher values correspond to more conflict. We also investigate the correlation between political centralization and “Types of violence against overarching political institution” (SCCS variable 1739) which ranges from 0 (no overarching political unit, through 1 (violent acts absent), 2 (acts of violence, in reaction against attacks by overarching political unit), to 3 (active resistance, aiming at revolution).

Another interesting hypotheses we can examine which often emerges in the literature on state formation in Africa (e.g. [Kopytoff, 1989](#)) is that political centralization is inhibited by the possibility of ‘fission’ (see also [Scott, 2010](#)). Since centralization typically involves one sub-set of a society exerting authority over the rest, this can create resentment and attempts to move away. In Africa, so the argument goes, low population density and an open frontier facilitate such fission. We can measure this directly via the variable “(No) Local Political Fission of Dissatisfied Persons” (SCCS variable 785) coded 1 (Often

³ The SCCS database also has a variable “Frequency of Warfare – Attacking” which is strongly positively correlated with political centralization. Nevertheless, since this variable is obviously very endogenous and likely reflects reverse causality and in any case does not capture the arguments made in the social science literature we do not present any regressions using it.

move to another community following disputes), 2 (Sometimes move to another community following disputes) and 3 (Rarely or never move to another community following disputes).

2.4. Other covariates and variables

In some specifications below, we present results which control for geographical characteristics and the disease environment. Geographical controls are for latitude and longitude of the location of the ethnic group as specified in the SCCS. To control for spatial variation in the disease environment, we include a measure of the total pathogen stress (SCCS variable 1260) which provides a composite measure of the prevalence and severity of seven pathogens (leishmanias, trypanosomes, malaria, schistosomes, filariae, spirochetes, and leprosy).

Finally, in Section 5 below we propose an identification strategy for the impact of population density on political centralization using the SCCS variable 921 “Agricultural Potential” as an exogenous source of variation in population density. This variable provides an index of overall agricultural suitability and combines indices of terrain slope, soil suitability, and climate. It is measured on a scale ranging from 4 (for poorest agricultural potential) to 23 (for highest agricultural potential).

2.5. Descriptive statistics

Table 1 presents some basic descriptive statistics of these variables. In column (1) we present the sample means for all observations in the SCCS dataset. To give some flavor of the correlations in the data, we also separate the means according to groups with low (below median) and high (above median) political centralization for the whole world (columns (3) and (4)), and for the Africa subsamples (columns (7) and (8)). Column 6 presents the African mean. In this case the median criteria implies that low political centralization refers to observations where our measure for state centralization, SCCS variable 237, equals 1 (82 observations) while high political centralization refers to cases where the variable equals 2 or higher (102 observations). The first two rows of the table simply tell us that the differences between low and high political centralization is statistically significant and columns 5 and 9 give the *p*-value of the *t*-test to test for significant differences.

Concentrating first on the whole world some interesting patterns emerge. In row 3 we see that while population density for low centralization polities is 2.675 it is 4.569 for high centralization. In column 5 the *p*-value for the *t*-test for the difference between these numbers showing that this difference is highly significant statistically. The incidence of being attacked is also significantly higher for high centralization polities, though trade (row 8) is not. Other potential explanatory variables seem little different, for example civil war and insurrection though the prevalence of fission is indeed greater for low centralization polities. Finally it is interesting to note that some of the potentially important covariates such as latitude or altitude are not significantly different between the two groups, though high centralization polities tend to be in places with greater agricultural potential.

Turning to Africa there are several things to observe. First, the average of political centralization is higher at 2.5 than it is in the entire world where it is just 2.082. Second, many of the differences which were significant in the entire world are no longer so, this is true for population density, being attacked and fission. Civil war and insurrection remain insignificantly different between low and high political centralization while all of the other variables are similarly insignificantly different. Given that there are significant differences in the levels of centralization in Africa these descriptive statistics anticipate some of the regression evidence we present later in the paper.

3. Implications of political centralization

3.1. Case-study evidence

Was the absence of political centralization in Africa important for economic development? The more recent academic literature on states certainly suggests this, though it does not focus on the extent of political centralization as an explanatory variable. Besley and Persson (2011) present various form of empirical evidence suggesting that features of ‘strong’ states, such as advanced fiscal systems, are positively correlated with economic development. Evans and Rauch (1999, 2000) similarly show that key features of the bureaucracy associated with strong states, such as meritocratic appointment and promotion, are association with good governance and economic outcomes. In Africa there is some direct econometric evidence on the impact of pre-colonial political centralization from Gennaioli and Rainer (2007) and Michalopoulos and Papaioannou (2011). They both show that parts of Africa which were historically more centralized politically have better public good provision and economic development (as measured by light intensity at night) today than parts which were less centralized politically.

What case studies we have of societies lacking centralized states suggest that such societies certainly did not have the potential for economic success. Some of these consequences of the lack of political centralization can be vividly illustrated by the comparison made by Douglas and Vansina in the 1950s between the Bushong, the dominant group in the Kuba state, and the Lele, effectively a stateless society. These two peoples faced each other across the two sides of the Kasai River in what is now the Democratic Republic of the Congo. As Douglas (1962, p. 211) herself put it:

Table 1
Summary statistics.

Variables (1)	Full sample				Africa			
	All (2)	Low political centralization (3)	High political centralization (4)	<i>p</i> -Value (3) vs. (4) (5)	All (6)	Low political centralization (7)	High political centralization (8)	<i>p</i> -Value (7) vs. (8) (9)
Political centralization	2.082	1.000	2.951	0.000	2.500	1.571	3.526	0.000
Levels of sovereignty	1.989	1.183	2.670	0.000	2.325	1.619	3.105	0.000
Population density	3.761	2.675	4.569	0.000	4.150	4.000	4.316	0.543
Being attacked	1.778	1.623	1.904	0.016	1.875	1.941	1.800	0.522
Civil war	1.550	1.486	1.602	0.288	1.719	1.765	1.667	0.711
Fission	2.250	2.571	2.000	0.004	2.333	2.333	2.333	1.000
Insurrection	1.296	1.229	1.311	0.745	1.235	1.000	1.364	0.623
Trade	3.333	3.238	3.393	0.438	3.182	2.750	3.429	0.071
Agricultural potential	16.73	15.92	17.45	0.003	17.45	17.10	17.84	0.399
Trypanosomes	1.355	1.476	1.255	0.016	1.650	1.619	1.684	0.773
Malaria	2.301	2.182	2.402	0.100	2.800	2.810	2.789	0.919
Total pathogen stress	12.58	11.70	13.32	0.003	16.28	15.95	16.63	0.484
Latitude	14.66	13.79	15.31	0.684	3.252	4.056	2.362	0.661
Longitude	14.55	−10.83	34.66	0.001	20.33	20.66	19.96	0.892
Altitude	448.6	428.1	435.8	0.935	743.7	720.6	769.4	0.794
Market exchange	2.791	2.610	2.907	0.228	2.650	2.000	3.083	0.033
Mode of transport	1.795	1.463	2.040	0.001	1.538	1.500	1.579	0.798
Land transport routes	1.536	1.148	1.847	0.000	1.447	1.350	1.556	0.363
Availability of credit	1.550	1.308	1.767	0.001	1.324	1.286	1.375	0.710
Money	2.607	1.914	3.178	0.000	2.525	2.238	2.842	0.145
Police	2.100	1.341	2.771	0.000	1.816	1.150	2.556	0.003
Writing and record-keeping	2.349	1.646	2.892	0.000	1.875	1.238	2.579	0.001
Metal smelting	0.199	0.061	0.304	0.000	0.550	0.429	0.684	0.110
Property rights in land	1.694	1.452	1.873	0.012	1.545	1.625	1.500	0.712
Observations	184	82	102		40	21	19	

Notes: Summary statistics obtained from the SCCS dataset. Political centralization refers to “Jurisdictional hierarchy beyond local community” (variable §237 in the SCCS) which ranges from 1 (No levels i.e. no political authority beyond community) to 5 (Four levels e.g., large states). For columns (3) and (4), *Low Political Centralization* refers to observations where §237 equals 1, while *High Political Centralization* refers to cases where variable §237 equals 2 or higher. Additional variables obtained from the SCCS are as follows: levels of sovereignty (§83), population density (§64), being attacked in war (§893), civil war, i.e. frequency of internal war (§891), fission i.e. local political fission of dissatisfied persons (§785), insurrection i.e. violence against overarching political institutions (§1739), trade i.e. market exchange outside community (§1734), and agricultural potential (§921). Total pathogen stress, malaria prevalence and trypanosomes prevalence are respectively variables §1260, §1255, and §1254. Additional variables are as follows: market exchange within local community (var. §1733), mode of land transport (head porterage, wheeled vehicles, motorized vehicles, etc.) (var. §13), types of land transport routes (trails, unpaved roads, paved roads, etc.) (var. §14), availability of credit (var. §18), use of money as medium of exchange (var. §17), presence of police service (var. §90), availability of writing and record-keeping (var. §149), metal smelting (var. §129), and communality of land (var. §1726) – this variable is re-scaled, so that higher values refer to the availability of property rights in land.

“The Lele and the Bushong are separated only by the Kasai River. The two tribes recognize a common origin, their houses, clothes and crafts are similar in style, their languages are closely related. Yet the Lele are poor, while the Bushong are rich ... Everything that the Lele have or can do, the Bushong have more and can do better.”

Some of the reasons for this relative poverty were obvious to Douglas. For example, the Lele use inferior technology, they do not use nets for hunting and Douglas noted “the absence of nets is consistent with a general Lele tendency not to invest time and labor in long-term equipment” (1962, p. 216). However, she also argued (1962, p. 216) that “Their eager purchase of firearms ... Shows their culture does not restrict them to inferior techniques when these do not require long-term collaboration and effort.” So she did not propose a cultural explanation for these technological differences. In comparison agricultural productivity in the Kuba state was much higher (1962, p. 219)

“The Bushong plant five crops in succession in a system of rotation that covers two years. They grow yams, sweet potatoes, manioc, beans, and gather two and sometimes three maize harvests a year. The Lele practice no rotation and reap only one annual maize harvest.”

Douglas argued that “If we wish to understand why the Lele work less, we need to consider whether any social factors inhibit them from exploiting their resources to the utmost” (1962, p. 224). Indeed, she claimed that the Lele were trapped into an inefficient social equilibrium. There was no process of political centralization (“each village is completely independent” 1962, p. 229) and

“Those who have anything to do with the Lele must have noticed the absence of anyone who could give orders with a reasonable hope of being obeyed ... This lack of authority goes a long way to explaining their poverty” (Douglas, 1963, p. 1).

Society was based on a self-reproducing system of dominance of young men by old men. “Old men monopolized economic activities and resources to extract rents” while young men were diverted into raiding and abducting and “such insecurity is obviously inimical to trade” (1962, p. 227). Thus Douglas tied the very poor economic outcomes and backward technology of the Lele to the fact that they had not undergone any process of political centralization.

The situation was very different in the Kuba country. As Vansina concluded in his history of the Kuba state (1978, p. 175)

“A starting point for economic development appears with the reign of Shyaam ... Technological innovations, especially in agriculture, began to spread throughout the country ... The staple crops were replaced by American crops, which had higher yields ... The main innovation was the introduction of a double ... even a triple ... annual harvest of maize.”

During this period, which Vansina dubbed the “Age of Kings”, agricultural output per-head also doubled. To achieve this “the whole agricultural calendar had to be reorganized, including the division of labor by sex” (1978, p. 177) and

“The first step in raising productivity was for the men to work more in the fields ... Second, the age of marriage was lowered, bringing young men .. Into the agricultural labor force. Young men did not work in the fields at all until marriage ... By the nineteenth century the result was that boys married young, at less than twenty years of age rather than at twenty-five or even, as among the Lele, thirty-five, thus adding a sizable portion to the labor available for agriculture” (Vansina, 1978, p. 180).

All of this was the outcome of the political innovations created by Shyaam probably in the 1620s. He created a state where one had not existed before.

So the contrast between the Bushong and the Lele and the roots of their differential economic development are closely tied to a process of political centralization that the Bushong experienced but the Lele did not. Once Shyaam had created a state in the Kuba country, the supply of public goods went up and so did agricultural productivity (and no doubt population density as well). There were general improvements in technology and market activity spread.

One can easily find many other descriptions in the literature of the institutions of stateless societies which suggest that they could not have experienced economic development (for instance Lewis (1961), on Somalia, or Colson (1969) on the Plateau Tonga of Zambia). Similarly one can also find other examples of political centralization playing a key role in promoting development. For one thing it is clear that the only societies in pre-colonial Africa which built large scale public goods like roads were those with the most centralized states (Asante, Buganda, Dahomey, and Ethiopia). Asante tried to build a railway and Ethiopia succeeded. Perhaps the most interesting example in Africa is Botswana. In Botswana, though population density was extremely low, the Tswana created a group of states⁴ where political power was centralized but controlled by an elaborate system of mechanisms of accountability focused on the *kgotla*. A Schapera (1940, p. 72) put it in his study of the Ngwato, the largest of the Tswana states

“all matters of tribal policy are dealt with finally before a general assembly of the adult males in the chief’s *kgotla* (council place). Such meetings are very frequently held ... among the topics discussed .. are tribal disputes, quarrels between the chief and his relatives, the imposition of new levies, the undertaking of new public works, the promulgation of new decrees by the chief ... it is not unknown for the tribal assembly to overrule the wishes of the chief. Since anyone may speak, these meetings enable him to ascertain the feelings of the people generally, and provide the latter with an opportunity of stating their grievances. If the occasion calls for it, he and his advisers may be taken severely to task, for the people are seldom afraid to speak openly and frankly.”

The Tswana tribes had states at least partially controlled by a *kgotla* which created both public goods and economic institutions such a secure property rights, things which all researchers place at the heart of Botswana’s extraordinary rate of economic growth since independence (see Acemoglu et al., 2003; Leith, 2005; Parsons and Robinson, 2006).

Nevertheless, it is also true that, as elsewhere in the world, political centralization in Africa did not automatically lead to the type of economic development which it did with the Bushong or the Tswana. It is necessary but not sufficient for economic development. Centralized states can also be predatory and many were in Africa. The most obvious examples being states during the period of the Atlantic slave trade, such as Kongo or Oyo. Even Asante, Buganda and Dahomey, though they constructed infrastructure, had many predatory features. Neither were the states in Burundi or Rwanda developmental.

⁴ Tawana (Batawana) in the north-west, Ngwato (Bangwato, Bamangwato or Bagamangwato) in east-central areas, Kwena (Bakwena) and Ngwaketse (Bangwaketse), Kgatla (Bakgatla) and Tlokwa (Batlokwa), Malete (Balete or Bamalete) and Rolong (Barolong) in the south-east.

Table 2

Political centralization and economic institutions.

	Market exchange	Mode of transport	Land transport routes	Availability of credit	Money	Police	Writing and record-keeping	Metal smelting	Property rights in land
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Political Centralization	0.252** (0.122)	0.432*** (0.0798)	0.425*** (0.0497)	0.221*** (0.0665)	0.486*** (0.0869)	0.927*** (0.0724)	0.678*** (0.0754)	0.0784*** (0.0266)	0.167** (0.0729)
Observations	95	183	179	168	182	178	184	184	97
R-squared	0.093	0.398	0.459	0.252	0.395	0.483	0.595	0.320	0.249

Notes: Dependent variables in columns (1)–(9) are as follows: market exchange within local community (var. §1733), mode of land transport (head portage, wheeled vehicles, motorized vehicles, etc.) (var. §13), types of land transport routes (trails, unpaved roads, paved roads, etc.) (var. §14), availability of credit (var. §18), use of money as medium of exchange (var. §17), presence of police service (var. §90), availability of writing and record-keeping (var. §149), metal smelting (var. §129), and communality of land (var. §1726) – this variable is re-scaled, so that higher values refer to the availability of property rights in land. All columns include continent fixed effects and controls for geographic characteristics and the disease environment. Continent fixed effects provide separate intercepts for five regions: Africa, Mediterranean, Eurasia, the Pacific, North America and South America. Geographic controls are for longitude and latitude. Disease environment controls are for total pathogen stress (SCCS var. §1260), which is a measure of prevalence and severity of seven pathogens (leishmaniasis, trypanosomes, malaria, schistosomes, filariae, spirochetes, and leprosy). Robust standard errors in parentheses.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

Indeed the state in Rwanda once it become more powerful in the 1860s and 1870s enserfed most of the rural population institutionalizing the distinction between Tutsi and Hutu in the process.

3.2. OLS regression evidence

As described in the last section the SCCS allows us to examine the correlation between political centralization and a number of public good and development outcomes. We take no strong stance on causality here but we believe it is interesting to examine whether one actually sees greater public good provision, for example, being positively correlated with political centralization. We therefore estimate the following model using OLS regressions

$$y_i = \gamma_c c_i + \mathbf{X}_i' \gamma + \eta_i \quad (1)$$

where c_i is the level of political centralization of society i , y_i , the dependent variable, is a measure either of public good provision in society i or one of the development outcomes discussed in Section 2. \mathbf{X}_i' are society level covariates and η_i is the disturbance term. Based on the above discussion we would anticipate $\gamma_c > 0$, at least in the case where we examine only the average effects (it is quite possible that investigating heterogeneous effects could help us understand such cases as Rwanda).

The results from estimating (1) are displayed in Table 2. All columns include continental fixed effects (Africa, Mediterranean, Eurasia, the Pacific, North America and South America), controls for altitude, latitude and longitude and the disease environment captured by total pathogen stress. In column 1 the dependent variable is market exchange and the estimated coefficient on centralization is $\hat{\gamma}_c = 0.252$ with a standard error of 0.122 which is significant at the 5% level. Other things equal higher political centralization is positively correlated with the extent of market exchange. Since a market is one of the most important examples of a public good which facilitates economic development and are likely supported and organized with the help of the state this correlation is interesting. In column 2 we have the mode of transportation as the dependent variable which is a simple development outcome. In pre-colonial Africa most transportation was by head portage and this was very inefficient economically.⁵ A higher score on the mode of transportation represents a polity which used more efficient methods of transportation. Column 2 shows that the use of efficient transportation is correlated with political centralization. Here $\hat{\gamma}_c = 0.432$ (s.e. = 0.0798) and highly significant. Indeed, looking across the columns one sees similar findings everywhere. Conditional on the covariates, political centralization is significantly positively correlated with all of the public goods and development outcomes.⁶

Though these regressions establish nothing about the causal relationship between centralization and these outcomes the significant correlations are consistent with the idea that the relative absence of political centralization in pre-colonial Africa was a potentially important source of its relatively poor economic performance.

⁵ Chaves et al. (2012) estimate social rates of return of around 100% associated with the replacement of head portage by railways in colonial West Africa.

⁶ We found very similar results for all the other similar variables we investigated. For instance loom weaving and pottery production are very similar to metal smelting.

4. Determinants of political centralization

4.1. Empirical results: OLS regressions

To examine whether or not the conditional correlations in the data are consistent with some of the fundamental hypotheses about the determinants of political centralization we first estimate Ordinary Least Squares (OLS) regressions of the form

$$c_i = \beta_d d_i + \beta_{dA}(d_i \cdot D_A) + \beta_\tau \tau_i + \beta_{\tau A}(\tau_i \cdot D_A) + \beta_w w_i + \beta_{wA}(w_i \cdot D_A) + \mathbf{X}_i' \boldsymbol{\beta} + \varepsilon_i \quad (2)$$

where c_i is as in (1) the level of political centralization of society i , d_i is a measure of population density, τ_i is measure of the extent of external trade, w_i a measure of the extent of external warfare. Since our main focus is on the determinants of political centralization in Africa and the extent to which these match those which have featured in the literature on Eurasia, we add an “Africa dummy” D_A and interact this with the potential explanatory variables. Since we add no other continental dummies this gives us a simple framework for analyzing whether or not Africa is different in the factors that determine political centralization. Finally \mathbf{X}_i' are society level covariates which include D_A and ε_i is the disturbance term. The existing literature in social science suggests the hypotheses that $\beta_d > 0$, $\beta_\tau > 0$ and $\beta_w > 0$ and we are particularly interested in the coefficients on the interactions β_{dA} , $\beta_{\tau A}$ and β_{wA} .

We estimate (2) using the whole world sample in Table 3. In this table the dependent variable is political centralization as measured by “Jurisdictional hierarchy beyond local community” (we examine Levels of Sovereignty later as a robustness check). In column 1 we estimate a very parsimonious model where the only explanatory variables are population density, the interaction between population density and the Africa dummy, and the Africa dummy itself. We see that on its own the estimated coefficient on population density is positive and highly significant, with $\hat{\beta}_d = 0.386$ with standard error = 0.0407. We also see, as Table 1 suggested, that the Africa dummy is positive and significant. Indeed the estimated coefficient is $\hat{D}_A = 1.631$ (s.e. = 0.442) and significant at the 1% level. Though Fig. 1 suggested that relative to much of the world political centralization has been lower historically in Africa, in the SCCS sample Africa is more centralized on average than the rest of the world. Of most interest however is the coefficient on the interaction between d_i and D_A . Interestingly we see $\hat{\beta}_{dA} = -0.317$ with standard error = 0.115. Not only is the coefficient on the interaction statistically significant but it is of the opposite sign and very similar in magnitude to the estimated direct effect $\hat{\beta}_d$. Indeed, it is natural to conjecture that the sum of these coefficients is statistically indistinguishable from zero. Therefore, in column 1 we report the F -statistic for this hypothesis which is 0.41 with a p -value of 0.52 suggesting that it is not possible to reject this null hypothesis. This implies that while for the whole world there is a positive correlation between population density and political centralization, something many scholars have conjectured, this correlation is not present in Africa (bearing in mind that this regression does not allow us to say anything about whether there is a causal relationship between these variables). In column 2 we add the full set of covariates which does little to any of the estimated coefficients or the standard errors and all the variables are still significant at the 1% level. The p -value for the null hypothesis that there is no correlation between population density and political centralization in Africa now increases.

In column 3 we then estimate a simple model where we replace population density with warfare in terms of the frequency of being attacked from outside. Here $\hat{\beta}_w = 0.293$ with standard error = 0.168 and just significant at the 10% level. Similar to what we found in the first two columns, the coefficient on the interaction with the Africa dummy is of opposite sign and similar magnitude with $\hat{\beta}_{wA} = -0.315$ (s.e. = 0.382), though it is not statistically significant. The Africa dummy is also not significant in this regression. We again report the F statistic and the corresponding p -value for the hypothesis that the sum of the direct and indirect effects is zero (i.e. $\beta_w + \beta_{wA} = 0$). As with population density the p -value suggests that we cannot reject this hypothesis. Column 4 then shows that these estimated effects are robust to our controlling for geographical characteristics and the disease environment. There is evidence here that warfare is indeed positively correlated with political centralization for the whole world but the story for Africa is similar to that with population density – there is no correlation between being attacked and political centralization.

Columns 5 and 6 then examine the relationship between trade and political centralization, first with our most parsimonious specification and then also with covariates. In column 5 the estimated coefficient of interest is $\hat{\beta}_\tau = 0.191$ (s.e. = 0.112) again positive and statistically significant at the 10% level, though none of the coefficients of interest are statistically significant in column 6 once we add the covariates. It is worth noting that we lose about one third of the sample in examining this channel, so these results might be thought to be even more tentative.

Columns 7–8 then adds all of these variables together without and with covariates and shows that the point estimate for population density remains statistically significant and hardly changes in magnitude. Here we test the natural but rather strong hypothesis that all the sums of the coefficients of the whole world plus the interaction with the Africa dummy are zero (i.e. $\beta_d + \beta_{dA} = 0$ and $\beta_\tau + \beta_{\tau A} = 0$ and $\beta_w + \beta_{wA} = 0$). The p -value for the F test suggests that we cannot reject this hypothesis.

Taken together the results of this table show that while the correlations in the SCCS are consistent with some of the most famous hypotheses about political centralization, this is not true for Africa. Indeed, in every case, for population density, warfare and trade we cannot reject the hypothesis that there is no correlation between these variables and political centralization in Africa.

Table 3

Correlates of state formation (full SCCS sample).

	Dependent variable: jurisdictional hierarchy beyond local community (SCCS variable §237)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Population density	0.386*** (0.0407)	0.363*** (0.0403)					0.361*** (0.0609)	0.295*** (0.0590)
Africa * Population density	–0.317*** (0.115)	–0.325*** (0.112)					–0.217 (0.180)	–0.173 (0.171)
Being attacked			0.293* (0.168)	0.364** (0.146)			0.263 (0.170)	0.253 (0.175)
Africa * Being attacked			–0.315 (0.382)	–0.472 (0.379)			–0.102 (0.366)	–0.220 (0.382)
Trade					0.191* (0.112)	0.172 (0.115)	0.0113 (0.107)	–0.0375 (0.117)
Africa * Trade					–0.000762 (0.258)	0.104 (0.263)	0.294 (0.227)	0.408* (0.227)
Africa dummy	1.631*** (0.442)	1.644*** (0.413)	0.975 (0.780)	1.064 (0.793)	0.863 (0.823)	0.253 (0.862)	0.595 (1.271)	0.263 (1.326)
F-stat	0.41	0.13	0.00	0.10	0.67	1.37	1.06	1.46
p-Value	0.52	0.72	0.95	0.76	0.41	0.24	0.37	0.23
Geographic controls	No	Yes	No	Yes	No	Yes	No	Yes
Disease environment control	No	Yes	No	Yes	No	Yes	No	Yes
Observations	182	182	152	152	98	98	94	94
R-squared	0.342	0.369	0.040	0.206	0.099	0.272	0.381	0.440

Notes: Geographic controls are for longitude and latitude. Disease environment controls are for total pathogen stress (SCCS var. §1260), which is a measure of prevalence and severity of seven pathogens (leishmaniasis, trypanosomiasis, malaria, schistosomiasis, filariasis, spirochetes, and leprosy). F-stat is for the test examining the hypothesis that the sum of the direct effect and the interaction effect in Africa equals zero. Robust standard errors in parentheses.

** $p < 0.05$.

* $p < 0.1$.

*** $p < 0.01$.

In Table 4 we then examine the robustness of these results using the different dependent variable Levels of Sovereignty. Since the definition of this also seems to capture political centralization it is worthwhile investigating what happens when we use this. The columns of Table 4 are identical to those of Table 3 but with the different dependent variable. Taken together the results with this dependent variable are quite consistent with those in Table 3 with a few interesting points. There is less robust evidence that being attacked is a significant correlate of political centralization for the whole world, while the evidence is more robust for trade. There is some evidence in the case of being attacked that one can reject the hypothesis that $\beta_w + \beta_{wA} = 0$ but if anything the estimated coefficients suggest that in Africa there is a negative correlation between the frequency of being attacked and political centralization (though of course one could rationalize such a coefficient as representing reverse causality).

Table 5 now turns to examine some of the other hypotheses which have been proposed to explain political centralization, in particular fission and internal conflict measured in two different ways. The first six columns are designed to examine parsimonious versions of the hypotheses linking these variables to political centralization while the last four columns add all the variables simultaneously with and without covariates and with and without population density. In columns 1 and 2 the main explanatory variable is Fission, in columns 3 and 4 it is our first measure of internal conflict “Frequency of Internal War” while in columns 5 and 6 it is our second measure, “Types of violence against overarching political institution.” The message that comes out of the parsimonious regressions in this table is quite clear. There is no evidence here for any robust statistically significant correlations between any of these variables and political centralization giving little support to theories which have proposed these as important explanatory variables in Africa or anywhere else (though column 1 does give a suggestion that the relationship in the whole world – though not Africa – does go in the right direction for the conventional wisdom). The regressions in the last three columns are more interesting, though given the very small sample size they should be treated with great caution. Taken at face value they present some evidence that there is a significant and positive correlation between civil war and political centralization in Africa. There is also some evidence that there may be a significant relationship between fission and centralization, though it has a sign which is different from that conjectured in the literature.

4.2. An identification strategy

Though the correlations of the last section are interesting we do not propose that they have a causal interpretation. In this context it is easy to think of many omitted variables which could be correlated with both the dependent and independent variables. This could cut both ways. It could imply that the positive correlations we found in the whole world between, for example trade, and political centralization are spurious. Perhaps centralized polities are better able to enforce property rights and contracts and thus generate more trade, a situation of reverse causation. Or perhaps political centralization is

Table 4
Correlates of state formation.

	Dependent variable: levels of sovereignty (SCCS variable §83)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Population density	0.388*** (0.0353)	0.379*** (0.0379)					0.397*** (0.0542)	0.325*** (0.0516)
Africa * Population density	–0.288** (0.131)	–0.314** (0.129)					–0.293 (0.220)	–0.272 (0.199)
Being attacked			0.199 (0.156)	0.263* (0.140)			0.106 (0.147)	0.0423 (0.137)
Africa * Being attacked			–0.645* (0.347)	–0.789** (0.327)			–0.263 (0.323)	–0.397 (0.331)
Trade					0.248** (0.103)	0.260** (0.104)	0.0255 (0.0898)	0.0102 (0.0918)
Africa * Trade					–0.254 (0.340)	–0.165 (0.362)	0.0511 (0.375)	0.160 (0.393)
Africa dummy	1.415** (0.560)	1.445*** (0.535)	1.428** (0.709)	1.456** (0.694)	1.695 (1.126)	0.980 (1.231)	1.995 (1.569)	1.620 (1.664)
F-stat	0.62	0.27	2.07	3.10	0.00	0.08	0.24	0.58
p-Value	0.43	0.60	0.15	0.08	0.99	0.78	0.87	0.63
Geographic controls	No	Yes	No	Yes	No	Yes	No	Yes
Disease environment control	No	Yes	No	Yes	No	Yes	No	Yes
Observations	182	182	152	152	99	99	95	95
R-squared	0.355	0.373	0.028	0.187	0.108	0.321	0.401	0.505

Notes: Geographic controls are for longitude and latitude. Disease environment controls are for total pathogen stress (SCCS var. §1260), which is a measure of prevalence and severity of seven pathogens (leishmaniasis, trypanosomes, malaria, schistosomes, filariae, spirochetes, and leprosy). F-stat reports the test statistic for hypothesis that the sum of the direct effect and the interaction effect in Africa equals zero. Robust standard errors in parentheses.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

more likely in places on the coast or rivers where naturally trade tends to be higher, a case of omitted variable bias. Likewise as we alluded to above, political centralization could lead to population expansion because it leads to increased agricultural productivity (as explicitly discussed in Vansina (1978)). In the African case it could be that other factors are biasing downwards the estimated coefficients. For instance, it is possible that even though population density does have a positive causal effect on political centralization, high population density tends to be associated with other factors which independently depress political centralization, maybe the disease environment. Though we have tried to control for omitted variables to the extent possible with the SCCS data this is not a substitute for a proper identification strategy.

Ideally, we would like instruments for all the main independent variables of interest, population density, trade and warfare. Though we investigated several options in the end we decided that we only had a credible instrument for population density. Still, since this variable plays the central role in Herbst (2000) and Bates (2001) it is possibly the most interesting to investigate. It is also almost certainly measured with greater precision than the other variables. The historical literature suggests a clear source of variation in population density, namely the agricultural potential of the region in which the state forms. Some work has directly tied the emergence of political centralization to agricultural potential (see Kottak (1972), or Reid (2002), on Buganda) and the mechanism is clear.⁷

We therefore now move to estimate 2SLS models where the first stage is

$$d_i = \alpha_p p_i + \alpha_\tau \tau_i + \alpha_w w_i + \mathbf{X}_i' \boldsymbol{\alpha} + v_i \quad (3)$$

where p_i is the agricultural potential of society i and then we estimate the second-stage model

$$c_i = \beta_d \hat{d}_i + \beta_\tau \tau_i + \beta_w w_i + \mathbf{X}_i' \boldsymbol{\beta} + \varepsilon_i \quad (4)$$

where the key exclusion restriction is that p_i is a determinant of population density but does not influence the extent of political centralization either directly (so it does not appear in (4)) or through any other channel. For this exercise we let c_i be jurisdictional hierarchy beyond the local community as in Table 3.

To make these results as easy to interpret as possible, and at the cost of some econometric efficiency, we estimate (3) and (4) separately for the whole world and Africa. The bottom panel, panel B of Table 6 presents the results of estimating (3) for both the whole world (columns 1 and 2) and just Africa (columns 3 and 4). In all specifications, there is a first stage between

⁷ We experimented with other variables as sources of variation. For example, the SCCS contains variables on the number of societies within various radii, 100 miles, 200 miles, etc. This turned out to be uncorrelated with either trade or warfare. We also examined various measures of disease incidence, such as the intensity of malaria and “total pathogen stress” as sources of variation in population density. However, all these measures were strongly positively correlated with population density suggesting reverse causality so we did not develop these ideas either.

Table 5

Correlates of state formation – other hypotheses.

	Dependent variable: jurisdictional hierarchy beyond local community (SCCS variable §237)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fission	–0.298** (0.140)	–0.200 (0.154)					–0.355* (0.207)	–0.275 (0.270)	–0.124 (0.202)	–0.207 (0.189)
Africa * Fission	0.361 (0.527)	0.436 (0.555)					1.236** (0.556)	1.415** (0.670)	0.980 (0.643)	1.360* (0.717)
Civil war			–0.0727 (0.157)	–0.119 (0.163)			–0.370 (0.234)	–0.231 (0.212)	–0.335** (0.160)	–0.244 (0.163)
Africa * Civil war			0.00814 (0.305)	–0.0623 (0.312)			1.477** (0.597)	1.414** (0.653)	1.474** (0.624)	1.442* (0.702)
Insurrection					–0.0363 (0.164)	–0.0858 (0.145)	0.102 (0.171)	0.0942 (0.176)	0.0909 (0.129)	0.147 (0.131)
Africa * Insurrection					0.220 (0.242)	0.301 (0.247)	–0.294 (0.374)	–0.384 (0.419)	–0.295 (0.380)	–0.441 (0.429)
Population density									0.235*** (0.0739)	0.243*** (0.0624)
Africa * Population density									–0.270 (0.442)	–0.258 (0.482)
Africa dummy	–0.232 (1.268)	–0.581 (1.384)	0.407 (0.608)	0.280 (0.647)	0.582 (0.486)	0.309 (0.581)	–4.458*** (1.442)	–4.751** (1.807)	–2.819 (2.929)	–3.687 (3.184)
F-stat	0.02	0.20	0.06	0.48	1.07	1.17	2.66	2.83	1.97	2.18
p-Value	0.90	0.66	0.81	0.49	0.30	0.28	0.07	0.06	0.14	0.11
Geographic controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Disease environment control	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	64	64	158	158	80	80	31	31	31	31
R-squared	0.115	0.195	0.018	0.155	0.085	0.266	0.382	0.482	0.536	0.618

Notes: Geographic controls are for longitude and latitude. Disease environment controls are for total pathogen stress (SCCS var. §1260), which is a measure of prevalence and severity of seven pathogens (leishmanias, trypanosomes, malaria, schistosomes, filariae, spirochetes, and leprosy). F-stat reports the test statistic for hypothesis that the sum of the direct effect and the interaction effect in Africa equals zero. Robust standard errors in parentheses.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.**Table 6**

Instrumental variable results.

	Full sample		Africa subsample	
	(1)	(2)	(3)	(4)
<i>Panel A: Second stage regression</i>				
	Dependent variable: jurisdictional hierarchy beyond local community (SCCS §237)			
Population density	0.461*** (0.117)	0.590*** (0.156)	0.337 (0.294)	0.503 (0.451)
<i>Panel B: First stage regression</i>				
	Dependent variable: population density (SCCS §64)			
Agricultural potential	0.168*** (0.0353)	0.147*** (0.0397)	0.231** (0.0995)	0.176* (0.0928)
F-stat	22.63	13.67	5.39	3.60
Geographic controls	No	Yes	No	Yes
Disease environment control	No	Yes	No	Yes
Observations	184	184	40	40

Notes: In Panel B, the instrument is agricultural potential (SCCS var. § 921). Regressions in columns (1) and (2) includes a dummy for the African region. Geographic controls are for longitude and latitude. Disease environment controls are for total pathogen stress (SCCS var. §1260), which is a measure of prevalence and severity of seven pathogens (leishmanias, trypanosomes, malaria, schistosomes, filariae, spirochetes, and leprosy). Robust standard errors in parentheses.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

our instrument (agricultural potential) and the endogenous variable (population density) though it is obviously weak in Africa. In column 2 for the whole world we find that $\hat{\alpha}_p = 0.147$ (s.e. = 0.0397) so highly significant and the regression as an F statistic of 13.67. For Africa in column 4 when we add the covariates we find $\hat{\alpha}_p = 0.176$ (s.e. = 0.0928) which is significant at the 10% level but with an F statistic of only 3.6 suggesting there may be a problem of a weak instrument (see Andrews and Stock, 2007).

Table 6, panel A, the top panel, then shows the resulting 2SLS estimates of (4). The magnitude of the 2SLS estimates are higher compared with our previous OLS results in Table 3. For example, in the 2SLS specification $\hat{\beta}_d = 0.590$ with a standard error of 0.156 compared with $\hat{\beta}_d = 0.363$ (s.e. = 0.0407) in the corresponding OLS regression. The higher 2SLS point estimates may partly be due to omitted variables which create a downward bias in our OLS results and it could also be due to classical measurement error biasing downwards the OLS coefficient, a problem which is solved with a valid IV strategy. However, the general pattern of our previous findings is confirmed in our IV results as we observe a positive relationship between population density and state formation in our full sample, but not in the Africa sub-sample.

5. Conclusions

In this paper we have undertaken to what our knowledge is the first systematic empirical investigation of the extent to which some of the classical hypotheses about the emergence of political centralization and states using the SCCS dataset. Though our particular focus has been Africa, this data allows us to put the African experience into a comparative context, though of course we recognize that there are many issues raised by the potentially selected nature of SCCS sample and the reliability of the data. Nevertheless, given the very high ratio of theory to evidence in this literature, such an exercise seems to be justified.

We found that while for the whole world there is very robust evidence that population density is significantly positively correlated with political centralization. We also found some evidence that the same is true for trade and the frequency of being attacked. Thus for the whole SCCS sample, the conditional correlations are consistent with some of the most famous hypotheses about state formation and the emergence of political centralization. We provided some evidence for the case of population density that these results can be interpreted as causal. Yet we also showed that none of these correlations are present for Africa. Indeed, none of the most famous hypotheses about political centralization are consistent with the variation in political centralization in Africa. We also showed that public goods and development outcomes are indeed positively correlated with political centralization in the SCCS which is consistent for the retarded extent of political centralization in Africa historically being an important part of the explanation for its relative underdevelopment.

These findings are very inconsistent with a large recent literature which has attempted to explain the development of African states through the lens of the Eurasian models (particularly Herbst, 2000; Bates, 2001; Reid, 2012). In fact they are more consistent with some of the views staked out as long ago as 1940 by Evans-Pritchard and Fortes which suggest that African state formation followed a different logic to that of Eurasia and indeed the rest of the world. In some sense this is not surprising. Just thinking about the variation in the 40 polities in the African sub-sample of the SCCS without running any type of regression, suggests it is very unlikely that there are simple relationships between these classical variables and the extent of political centralization. The sample includes such societies as the Igbo and Tiv in Eastern Nigeria and the Kikuyu of Kenya. All lived in fertile zones of high population density, none featured political centralization. At the same time other societies, such as the Tswana, lived in much more marginal ecological conditions with low population density, but states. Similarly the Igbo traded intensely, while Buganda developed without intensive external contact. It could be that the SCCS sample is in some sense unrepresentative, which the results of Fenske (2012) might be interpreted to suggest, yet we doubt this is the case. Rather, we have suggested that the history of African political centralization is instead a fertile source of ideas for a different politics of political centralization and state formation.

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