Precolonial Centralization, Foreign Aid and Modern State Capacity in Africa

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Abstract

In this paper, we empirically examine the determinants of bureaucratic capacity in contemporary Africa. We connect the aid-governance literature with historical and anthropological work on African state formation. Our results show a positive and statistically significant impact of precolonial centralization on *levels* of bureaucratic quality in Africa, from the late-1990s onwards. Before the late-1990s, however, there is no such relationship. We also find that negative effects of aid dependence on *changes* in bureaucratic capacity weaken or even disappear, once we control for precolonial centralization. As the colonial interlude is becoming more distant, the influence of precolonial political institutions on modern bureaucratic capacity is reasserting itself. The role of aid turns out to be less important than suggested by either its critics or its supporters.

Key words: Africa • Foreign Aid • Precolonial Centralization • State Capacity

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1. Introduction

The functioning of the state is one of the core issues in economic development. A major strand of literature in political science and economics highlights the importance of state institutional capacity for collecting taxes, protecting property rights, and ultimately for economic growth and development (Acemoglu, Johnson, & Robinson, 2001, 2002; Besley & Persson, 2010, 2011; Dincecco & Prado, 2012; Engerman & Sokoloff, 1997; North, 1990). Findings from this literature help us understand why some regions are more prosperous than others. In particular, many authors argue that present-day low income levels in Africa can partly be attributed to dysfunctional state institutions (e.g. Acemoglu & Robinson, 2010; Bates, 2008; Meredith, 2005). The question which factors explain differences in state capacity in modern-day Africa is less well explored (Fenske, 2014; Thies, 2009).

In this paper, we empirically explore the determinants of contemporary *bureaucratic capacity* – generally considered a key component of state capacity – in contemporary Africa. The term bureaucratic capacity refers to a state with an effective public administration (Evans & Rauch, 1999; Rauch & Evans, 2000). Our point of departure is a "Weberian bureaucracy which is structured along impersonal, technocratic, hierarchical lines. Its written records provide a strong institutional memory, and its personnel has formal salaries, relies on standard operating procedures and knowledge-based rules, and answers to superiors who (ideally) take decisions according to impersonal, technocratic criteria" (Bräutigam, 2008, p. 15).

We first examine the historical determinants of the *level* of bureaucratic quality in 2014. We find a strong and statistically significant positive relationship between the degree of precolonial political centralization and present bureaucratic quality. The estimated impact of this variable trumps all other variables in our level regressions. Furthermore, we find a clear difference before and after the late-1990s, with a stronger estimated impact of precolonial centralization in the latter period.

We then examine the correlates of *changes* in bureaucratic quality over time. Foreign aid is found to be a major correlate of deteriorations in bureaucratic quality over time, which is consistent with the views and findings of aid pessimists (Ayittey, 2005; Bauer, 1975; Easterly, 2006; Friedman, 1958; Moyo, 2009). Here, the novel contribution of the paper is that we subsequently examine to what extent the relationship between aid dependence, one of the important proximate determinants of bureaucratic quality, is affected when we control for more ultimate historical variables such as the degree of precolonial centralization. When precolonial centralization is included in the regressions, the results with respect to aid dependence change dramatically. The aid dependence variable loses most of its explanatory power, while we find a positive and highly statistically significant relationship between precolonial centralization and improvements in bureaucratic quality. Countries with a more centralized political history tend to improve their bureaucratic capacity over time. Our findings suggest that the

previous empirical literature on the aid-governance link failed to account for more ultimate causes of bureaucratic development. Foreign aid simply appears less important than deeper historical experiences in explaining the recent evolution of bureaucratic quality in Africa.

To our knowledge, no previous work has examined the relationship between precolonial centralization and bureaucratic capacity. However, the role of precolonial centralization in shaping the related concept of good governance has been studied by Gennaioli and Rainer (2006); they find a positive impact of precolonial centralization on two proxies of good governance, *rule of law* and *control of corruption*, during the period 1996-2004. Our paper differs from their approach in a number of important ways. First, we focus on state capacity, a more limited and more precisely defined concept than good governance. Next, our data on bureaucratic quality cover a much longer time period (1984-2014) than the dataset of Gennaioli and Rainer. This is crucial as we find the relationship between ancient political centralization and contemporary state capacity becomes less strong and less statistically significant the further back we go in time. The findings of Gennaioli and Rainer (2006) suggest that the link between precolonial centralization and institutional quality has been persistent since independence; we show that this is not the case. Finally, a core, and novel, contribution of our paper is the inclusion of precolonial centralization in studies evaluating the impact of foreign aid on state capacity, and the finding that such centralization fundamentally alters the estimated impact of aid.

Our results are robust to controlling for a number of additional variables suggested by previous research. Furthermore, the results remain intact when we use an alternative estimation strategy based on instrumental variables. In sum, our empirical findings imply that precolonial experiences have become *more* important over recent decades, suggesting a re-emergence of deeper historical roots in Africa as the colonial experience is fading.

The paper is structured as follows. In the next section we briefly review the relevant literature. Section 3 discusses data and methodology. In Section 4 we present our main empirical results using OLS regressions. Section 5 investigates the robustness of our results using instrumental variable regression. Section 6 concludes.

2. Background and Literature Review

2.1. Measurement of State Capacity

The concept of state capacity is often combined with more general good governance indicators such as the rule of law, control of corruption or protection of property rights. However, we argue that state capacity is an important and separate (although related) concept. Most scholars using the term 'good governance' refer to the normative aspect of governance, in particular decision-making practices which are considered ethically and socially desirable (Kaufmann, Kraay, & Zoido-Lobatón, 1999). The

concept of 'state capacity' avoids normative conceptions about what the state ought to do or how it ought to do it. It can refer to different dimensions of state power, such as coercive/military capacity, fiscal, administrative, legal or political capacity or relational/territorial coverage, but all dimensions have a clear, positive basis rather than a normative interpretation.

Hendrix (2010) concludes that (1) survey measures of bureaucratic quality and (2) indicators of taxation capacity are the most theoretically and empirically grounded indicators of state capacity. The fiscal dimension of state capacity emphasises the ability of the state to collect taxes from its citizenry (Levi, 1988; Tilly, 1975). Commonly used proxies for fiscal capacity in both the theoretical and empirical political economy literature are (i) the share of direct taxes in total tax revenues or (ii) tax revenue as a percentage of gross domestic product (GDP) (Besley & Persson, 2008; Dincecco & Prado, 2012; Tammen & Kugler, 2012). Those indicators, however, suffer from a number of shortcomings: First, those measures do not only measure the capacity to tax, but also the willingness to tax and be taxed. Normative preferences of the population about the optimal level of taxation may vary quite significantly. Second, governments in countries with rich natural resources find it fairly easy to collect tax revenues provided they have enough coercive capacity to protect the resources.

With this in mind, we choose to focus on the administrative (or bureaucratic) component of state capacity. Bureaucratic capacity can be regarded as a precondition for taxation capacity, and survey-based measures of bureaucratic capacity are available over a long period of time for a substantial number of countries. Furthermore, in contrast to the fiscal dimension of state capacity, bureaucratic quality is a conceptually clearer measure of state capacity. It is also, due to the powerful theoretical legacy of Max Weber (1922), probably the most widely studied component of state capacity. [1] A key reason behind its suggested importance is that a professional bureaucracy outlives rulers and is crucial for the impersonal implementation of politics (North, Wallis, & Weingast, 2009). Moreover, countries with high bureaucratic quality possess bureaucracies that tend to be somewhat autonomous from political and economic pressures and tend to have developed extensive mechanisms for recruitment and training (Evans, 1995; Rauch & Evans, 2000).

2.2. Foreign Aid and Contemporary African Development

A large literature attributes a part of the weakening of central administrations and the decline in state capacity in several African countries to the negative influences of foreign aid (e.g. Ayittey, 2005; Bauer, 1975; Easterly, 2006; Moyo, 2009). According to aid pessimists, state institutions in recipient countries have lost a significant amount of decision-making power through large aid dependence, as a result of

[1] The theoretical and empirical associations between bureaucratic autonomy and the various measures of state capacity that scholars have presented are discussed by Cingolani, Thomsson and De Crombrugghe (2015).

which policy making was partly or entirely externalized. The nature of the African state made it perfectly possible that a neopatrimonial regime could coexist with a Weberian rational bureaucracy (van de Walle, 2001). Van de Walle (2001) is convinced that the "institutionalization of crisis management over a twenty-year period has disempowered central administrations for the benefit of donor experts and ad hoc domestic decision-making structures. The decline of state capacity has invigorated patrimonial tendencies throughout the region" (p. 275).

Numerous studies have examined the effect of foreign aid on *growth* rates yielding ambiguous results (Arndt, Jones, & Tarp, 2010; Burnside & Dollar, 2000; Clemens, Radelet, Bhavnani, & Bazzi, 2011; Doucouliagos & Paldam, 2008; Easterly, Levine, & Roodman, 2004; Lensink & White, 2001; Mekasha & Tarp, 2013; Rajan & Subramanian, 2008). Another strand of the aid literature has aimed at quantifying the effects of development assistance on *good governance* and *democratization* (Bermeo, 2011; Bueno De Mesquita & Smith, 2010; Djankov, Montalvo, & Reynal-Querol, 2008; Dunning, 2004; Goldsmith, 2001; Kalyvitis & Vlachaki, 2012; Knack, 2004; Rajan & Subramanian, 2007). However, the literature that empirically explores the causal link between aid dependence and *state capacity* remains surprisingly sparse. Knack (2001) finds a robust statistical relationship between high aid levels in Africa and deteriorations in bureaucratic quality. Similarly, Bräutigam and Knack (2004) find robust statistical evidence that higher aid levels correspond with larger declines in tax revenues as a share of GDP in Sub-Saharan Africa. Knack and Rahman (2007) explore how competitive donor practices can erode administrative capacity in recipient countries. Selaya and Thiele (2012) suggest that the functioning of the bureaucracy is adversely affected by grants, but not by loans.

A more nuanced view is taken by another group of scholars who are less pessimistic about the consequences of foreign aid. We will call them conditional optimists. Their work shows that large quantities of development assistance do not systematically affect the quality of policies or institutional capacity (Alesina & Dollar, 2000; Rodrik, 1996). Those scholars argue that the economic returns to aid are highest in sound institutional environments and lowest in poor institutional environments, regardless of whether 'environment' is defined in terms of prudent macroeconomic policy or a broader set of political and economic institutions (Burnside & Dollar, 1997, 2000; Dollar & Pritchett, 1998). While Collier and Dollar (2002) admit that aid could become detrimental beyond a certain threshold level even in a 'good' policy environment, "the point at which aid starts to have negative effects is well above the range pertinent for most of Africa" (Collier, 1999, p. 531).[2] Our results will challenge many of the findings of both pessimists and conditional optimists by showing that the inclusion of precolonial centralization alters previously estimated links between aid and bureaucratic capacity.

[2] See chapter 14 of Szirmai (2015) for a recent survey on the theoretical and empirical literature on foreign aid.

2.3. Historical Roots of Contemporary African State Structures

An interesting strand of literature emphasizes the role of deep historical roots of contemporary state characteristics. It addresses the question why both state formation and institutional development evolved differently in Europe and Africa. The applicability of the Eurasian model to explain differential political institutional development between Europe and Africa plays a major role in the work of Diamond (1997), Herbst (2000) and Bates (2001). One of the central paradoxes in European state formation is the fact that "the pursuit of war and military capacity, after having created national states as a sort of by-product, led to a civilianization of government and domestic politics" (Tilly, 1990, p. 206). A large number of African states, however, gained independence without the need to combat former colonial rulers (important exceptions being Algeria, Angola, Kenya and Mozambique) or regional neighbors. Most of the conflicts in post-colonial Africa were intrastate conflicts. Since African states have seldom fought wars of conquest, e.g. interstate wars, their governments faced few significant external threats. As a result, the pressure to build an effective central administration that levies taxes and protects private property was significantly lower compared to the European experience (Bates, 2001; Herbst, 1990).

Another major factor which is positively associated with state formation in Europe is increasing population density. According to Bairoch (1988), increased urbanization and better transportation networks during the Industrial Revolution in Europe significantly promoted state formation and modern state capacity. The increasing population density in Europe made land relatively scarce and therefore very attractive to control (Tilly, 1990). In contrast, low population density and land abundance formed obstacles to political centralization in large parts of Africa as many African governments found it difficult to penetrate and control major parts of their hinterlands (Mamdani, 1996). As low population densities make territorial conflicts less likely, governments have fewer incentives and less means to extend their rule beyond the capital cities and a few other population centers (Bates, 2001; Herbst, 2000). Diamond (1997), in turn, argues that differences in prehistoric biogeographical conditions have influenced the timing of the transition from hunter-gatherer societies to subsistence farming. Compared to other continents, Eurasia benefited from an advantageous geographical location that gave the latter a head start in the Neolithic Revolution. Thanks to its location in the Mediterranean zone and its West-East orientation of the continent's major axis, (Western) Eurasia was prehistorically better endowed with valuable wild plant and animal species suited for domestication than other continents such as Africa. With Eurasia being the earliest center of domestication, settled agriculture and subsistence farming developed earlier and faster leading to a more rapid population density and ultimately state formation.

Other scholars argue that political institutional development in Africa took a different path historically creating qualitatively very different state structures. In many developing countries, the legitimacy of modern state institutions remains weak as the internal pacification of the territory has not yet been completed, partly because the impetus for modern state formation and institutional capacity development in developing countries was colonial penetration (Szirmai, 2015; Young, 1994). In fact, one of the most salient features of Africa's contemporary state bureaucracy is its inherited colonial legacy. An important strand of quantitative and qualitative literature has stressed the long-term effects of colonial intrusion on contemporary development, public goods provision and state capacity in Africa (Acemoglu et al., 2001; Frankema & van Waijenburg, 2014; Frankema, 2011; Huillery, 2009, 2010; Young, 1994). One of the negative consequences of colonization is the arbitrary nature of post-colonial boundaries in the process of colonial state formation (Alesina, Easterly, & Matuszeski, 2011; Englebert, 2000). Yet another strand of literature goes further back in time, emphasizing the importance of the slave trade in explaining the weakness of contemporary African states and the lack of economic development (Manning, 1990; Nunn & Wantchekon, 2011; Nunn, 2008).

The historical, political science literature and the anthropological literature on African state formation emphasize the continuity of precolonial institutions in African history (Boone, 2003; Fortes & Evans-Pritchard, 1940; Mamdani, 1996). Their line of reasoning is supported by a growing body of empirical research that studies the importance of precolonial ethnic institutions for contemporary public goods provision and economic development in Africa. On average, better provision of basic public goods (education, health, and infrastructure) is found in African regions with more centralized precolonial institutions (Gennaioli & Rainer, 2007; Osafo-Kwaako & Robinson, 2013). Michalopoulos and Papaioannou (2013, 2014, 2015) attribute a higher regional *economic* development in the historical homelands of ethnicities to centralized, hierarchical, precolonial political institutions. Precolonial centralization is a robust correlate of regional development outside Africa as well: Studying the historical formation of Native American reservations, Dippel (2014) uncovers a negative link between forced integration of autonomous polities into a system of shared governance and long-run economic development.

The relationship between precolonial centralization and *political* or *administrative* development is less well explored. Hariri (2012) studies the impact of precolonial state development on current levels of democracy for a large sample of non-European countries. In the paper most closely related to ours, Gennaioli and Rainer (2006) suggest that African countries with higher precolonial centralization show lower levels of corruption and a stronger rule of law today. As outlined in the introduction, we focus on a different outcome variable and use a longer time-series than Gennaioli and Rainer. Most importantly, we also connect the historical, political and anthropological literature on African state

formation reviewed in this section with the aid-governance literature of the previous section. In doing so, our work simultaneously explores both the proximate and more ultimate determinants of modern state capacity in Africa.

3. Data and Methodology

We pursue two lines of analysis, one focusing on *levels* of bureaucratic capacity, the other on *changes* in bureaucratic capacity. In the level analysis, our dependent variable is the *level* of bureaucratic quality in 2014. In the change analysis, the dependent variable is the degree of *change* in bureaucratic quality over time. The bureaucratic quality index used in this analysis comes from the PRS Group's International Country Risk Guide (ICRG). It measures bureaucratic capabilities and the extent to which the bureaucracy succeeds in minimizing policy shifts when governments change. The index is an expert survey measure and must therefore be regarded as a subjective indicator. It reflects perceptions of changes in bureaucratic quality, not actual changes. According to Hendrix (2010), this index "most closely captures the important components of the theoretical construct of bureaucratic/administrative capacity: professionalism, insulation from political pressure, and efficacy in delivering government services" (p. 278). The index ranges from zero to four and covers 37 African countries for the period 1984-2014.[3]

As a check for the robustness of our findings, we also use the Government Effectiveness Index – one of the six Worldwide Governance Indicators of the World Bank. We emphasize that the ICRG measure of Bureaucratic Quality is closer to what we aim to study in this paper. Hence, the World Bank Government Effectiveness Index should be thought of only as a proxy - for administrative state capacity - that allows us to check the extent to which our results depend on a specific indicator of state capacity. Besides suffering from the drawbacks of good governance indicators discussed above, the Government Effectiveness index covers a much shorter time span (1996-2014) than the Bureaucratic Quality index. On the positive side, data are available for almost all 54 African countries – except South Sudan. This allows us to increase the sample size.[4] We shall see that the proxy indicator gives results very similar to those found using our preferred indicator.

Our main explanatory variables are (i) foreign aid dependence and (ii) precolonial centralization. Our measure for aid dependence is constructed in the following way: we take annual total DAC-ODA

[3] The first observation for the countries of Botswana, Burkina Faso, Congo Republic, Ethiopia, Madagascar, Mozambique, Niger, Sierra Leone and Somalia is 1985. The coverage for Gambia and Guinea-Bissau starts in 1986. For those countries, we will assume that the starting value in 1984 equals the value in 1985 or 1986, respectively. Data for Namibia is available from 1990 onwards.

[4] A list of countries for which the Bureaucratic Quality Index and the Government Effectiveness Index is available can be found in Appendix A (Table A.1).

disbursements in current dollars from the OECD/DAC database and divide them by the GDP (in current dollars) of the respective recipient country. GDP data come from the World Development Indicators published by the World Bank. Several previous studies within the foreign aid literature have used the same or similar variables (Bräutigam & Knack, 2004; Djankov et al., 2008).

Our proxy for the degree of precolonial centralization comes from Gennaioli and Rainer (2007). The authors developed a centralization index at the national level for 48 countries in Africa.[5] The index aims to capture the degree of political complexity on the continent in precolonial times. Their original data come from Murdock (1967) and from the Atlas Narodov Mira, a Soviet ethnographic source (Bruk & Apenchenko, 1964). Gennaioli and Rainer (2006, 2007) measure precolonial political institutions using Murdock's "Jurisdictional Hierarchy Beyond the Local Community Level" index. The index is an ordered variable, ranging from 0 to 4. It describes the number of political jurisdictions above the local level for each ethnicity.[6] A zero score indicates stateless societies "lacking any form of centralized political organization." A score of 1 designates petty chiefdoms; a score of 2 is associated with paramount chiefdoms; and a score of 3 or 4 refers to ethnic groups that were part of large states.[7] An ethnic group is defined as "centralized" if it has 2, 3, or 4 jurisdictional levels above the local community. An ethnic group is defined as "fragmented" if it has "only" 0 or 1 jurisdictional levels above the local community. While highly centralized ethnic groups "have developed a form of government with large, territorially integrated political entities, (…) fragmented ethnic groups have been traditionally organized in a multitude of small and fragmented, political entities, often lacking any political integration above the local village" (Gennaioli & Rainer, 2007, p. 188). Prime examples of highly centralized groups are the Kaffa (Ethiopia), the Luba (Democratic Republic of Congo) or the Yoruba (Nigeria).[8] For each country, Gennaioli and Rainer construct an index at the national level measuring the share of the non-European population that belongs to indigenously "centralized" ethnic groups. The scale ranges between 0 and 1, whereby a higher value corresponds to a more "centralized" precolonial national state.[9]

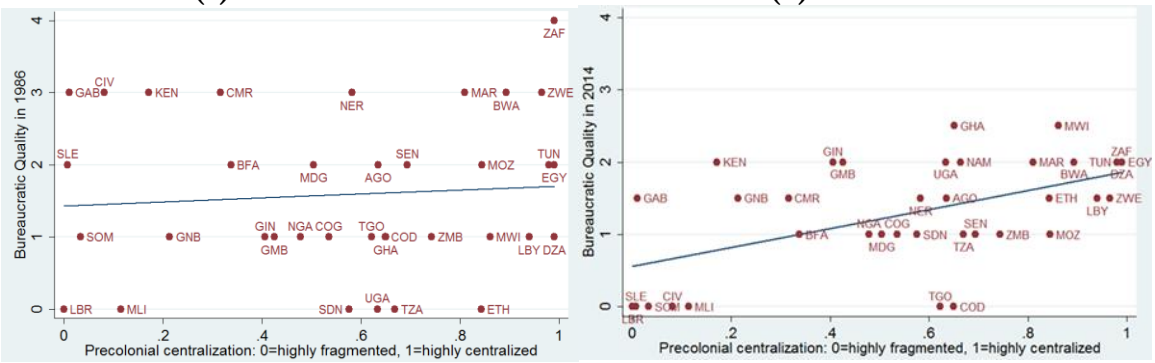
Level analysis

[5] In their study, Gennaioli and Rainer (2007) focus on Sub-Saharan Africa excluding South Africa which reduces their sample to 42 countries.
[6] The local level usually refers to the village level.
[7] The classification resembles that of Diamond (1997), who distinguished between four different social structures: bands, tribes, chiefdoms, and centralized states.
[8] The ancient kingdom of Kaffa (c.1390–1897) was an early modern state located in what is now Ethiopia. The Luba Empire (c. 1585–1885) was once an influential Central African state in what is now the Katanga Province of the Democratic Republic of the Congo. The Oyo Empire (c. 1400–1895) was a Yoruba empire of what is today western and northern Nigeria. It became one of the largest West African states in precolonial times.
[9] Detailed descriptive statistics on bureaucratic quality, foreign aid dependence and precolonial centralization can be found in Appendix A.

A first exploration of the relationship between precolonial centralization and bureaucratic quality is provided in the bivariate plots of Figure 1. Figure 1a plots the level of bureaucratic quality in 1986 against the degree of precolonial centralization. Figure 1b does the same for 2014.[10] While the relationship between precolonial centralization and bureaucratic quality is strongly positive in 2014, there is hardly any relationship to be discerned in 1986. Thus the relationship weakens as we go back in time. [11] [12]

Figure 1: Relationship between Precolonial Centralization and Bureaucratic Quality

(a): 1986 **(b) 2014**



Subsequently using OLS regression, we will test whether the empirical results confirm our first impressions. In the level analysis, we will explore to what extent contemporary African bureaucratic capacity can be explained by long-run historical factors. We use the level of bureaucratic quality in 2014 as our dependent variable. Our main explanatory variable of interest is the country-level measure of precolonial centralization. Our regression specification for the *level* analysis is:

$$BQ_i = \beta_0 + \beta_1 * precolonial\ centralization_i + \beta'_2 * X_i + \varepsilon_i \qquad (1)$$

The parameter β_1 captures the relationship between precolonial centralization and the level of bureaucratic quality in 2014. We include a vector of covariates of bureaucratic quality, in order to control for potential confounding factors. Our main control variables for the analysis are colonial

[10] We use the year 1986 as data on bureaucratic quality in 1984 and 1985 is missing for several countries (Botswana, Burkina Faso, Congo Republic, Ethiopia, Gambia, Guinea-Bissau, Madagascar, Mozambique, Namibia, Niger, Sierra Leone and Somalia). To make a meaningful comparison between different years, we prefer to compare the same sample of countries for both the starting and end year of the period.

[11] This is clear if one compares the plots for 1984, 1990, 1995, 2000, 2005, 2010 and 2014 (see Figure B.1 in Appendix B).

[12] Scatterplots describing the relationship between the level of bureaucratic quality and precolonial centralization for other intermediate years are available upon request.

legacy[13], legal origin[14], population density in 1400[15], artificial state borders[16], geographic factors[17], aid dependence[18], domestic and external violence[19], natural resource wealth[20] and level of economic development measured by GDP per capita[21].

There are, of course, several other potential confounding factors mentioned in the literature. These include, among others, slave exports, the length of experience with state institutions, communist legacy, constraints on the executive, ethnolinguistic fractionalization and polarization, cultural heritage proxied by differences in religion, gross public revenue per capita extracted from the citizenry during the colonial period, or the intensity of European settlement during colonial and modern times. Due to space limitations these variables are not further discussed in this paper. We have performed additional regression estimations controlling for these variables, but the main results are not affected in any important ways. The additional regression estimations can be found in the online appendix. A detailed description of all variables used in the analysis is given in Appendix D.

Change analysis

In this subsection, we will empirically investigate the *changes* of bureaucratic capacity in Africa over time. Our changes analysis covers the years 1984-2014. Our regression specification for the *change* analysis is:

$$\Delta BQ_{i,84-14} = \beta_0 + \beta_1 * BQ_{i,84} + \beta_2 * \overline{Aid\ Dependence}_{i,84-13} + \beta'_3 * X_{i,84-13} + \varepsilon_i \quad (2)$$

[13] The only two non-colonized African countries are Ethiopia and Liberia.
[14] Legal systems in Africa either belong to the English common law or the French civil law family (La Porta, Lopez-de-Silanes, Shleifer & Vishny, 1999).
[15] Based on previous work by Boserup (1981), Reynolds (1986), Acemoglu et al. (2002), as well as Ashraf and Galor (2011, 2013), we believe that it makes sense to use population density as an indicator of technological performance and therefore rough proxy for comparative economic development during the Middle Ages.
[16] We use the partitioned measure from Alesina et al. (2011) as proxy for artificial state characteristics.
[17] Geography controls include (i) latitude, (ii) percent of cultivated land in Köppen-Geiger climate zone A (humid climate with no winter), (iii) percent of cultivated land in Köppen-Geiger climate zone B (dry climate with no winter), (iv) mean distance (in kilometers) to nearest coastline or sea-navigable river and (v) the extent of mountainous terrain. Data with regard to the first four variables come from Gallup et al. (1999), data on mountainous terrain is obtained from Fearon and Laitin (2003).
[18] We take the average aid dependence for each country between 1961 and 2013 for those African countries that became independent in 1960 or before. For those countries that became independent after 1960, we take the average value of aid dependence between the year after the country's year of independence and 2013.
[19] We use data from the Major Episodes of Political Violence (1946–2013) dataset produced by the Center for Systemic Peace (Marshall, 2014).
[20] We construct an oil production dummy. The variable measures the proportion of years, for each country, in which oil has been produced. Oil-rich countries like Angola and Sudan that have produced oil every single year since independence are coded as one. Non-oil countries such as Botswana or Ethiopia are coded as zero.
[21] The variables domestic and external violence as well as GDP per capita are constructed in the same way as the aid dependence variable (see Footnote 18).

where $\Delta BQ_{i,84-14}$ is the change in bureaucratic quality in country i over the time period 1984-2014, $BQ_{i,84}$ is the level of initial bureaucratic quality in country i in 1984, $\overline{Aid\ Dependence}_{i,84-13}$ is the average level of DAC-ODA aid as a percentage of GDP over the time period 1984-2013. Parameter β_2 captures the relationship between aid dependence and the change in bureaucratic quality. We also include a vector of time-varying covariates of bureaucratic quality, $X_{i,84-13}$, in order to control for potential confounding factors. [22]

This specification limits the extent of problems related to omitted variable bias. By regressing the change of bureaucratic quality over time on its initial level, we capture regression-to-the-mean effects and control for the opportunity of initially high- and low-performing countries to decrease and increase their scores, respectively. Moreover, controlling for the initial level of bureaucratic quality helps us to control for a large set of historically slow-moving factors explaining differences in the level of bureaucratic quality across countries, such as ethnolinguistic fractionalization, geographic factors, or unobservable characteristics like culture. We also control for domestic and external political violence in the host country. Domestic (and external) violence usually attracts a significant amount of development assistance – particularly humanitarian and post-conflict assistance. Failing to account for political violence can therefore produce a spurious correlation between aid levels and weakened state capacity.[23] We also control for ethnic tensions.[24] [25] Since the ICRG ratings on bureaucratic quality are subjective indicators, economic performance may influence the ratings even in the absence of a causal relation. If recipient countries witness economic growth concomitant with improving state capacity and declining levels of development aid, or vice versa, controlling for changes in the development level is crucial to avoid a spurious correlation between aid dependence and bureaucratic quality. We also control once again for natural resource wealth.

The main difference with the existing literature on the relationship between foreign aid and various political or institutional features (including the small literature on aid and state capacity) is that we will control for precolonial centralization. Controlling for precolonial centralization may be

[22] Due to the limited degrees of freedom, the control variables are not all entered simultaneously.

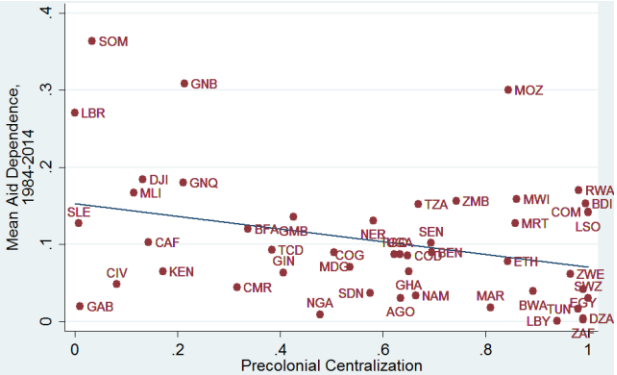
[23] Data on both domestic and external political violence come from the Center for Systemic Peace (Marshall, 2014) and from the International Country Risk Guide (ICRG) by the PRS Group. Data on political violence from the PRS Group's International Country Risk Guide (ICRG) is only available from 1984, however, and thus only used for robustness checks.

[24] The data comes from the PRS Group's International Country Risk Guide (ICRG) as well. The index of ethnic tensions is time-variant and assesses the degree of tensions within a country attributable to racial, nationality or language divisions. Seminal contributions on ethnic, linguistic, and religious fractionalization using time-invariant indices include Alesina, Devleeschauwer, Easterly, and Kurlat (2003), Desmet, Ortuño-Ortín and Wacziarg (2012), Easterly and Levine (1997) as well as Montalvo and Reynal-Querol (2005).

[25] In the empirical analysis, we are using the average values of the domestic violence, external violence and ethnic tension indices for each country over the time period 1984-2013.

counterintuitive at first, since we already control for the initial level of bureaucratic quality. By controlling for the initial level of bureaucratic quality, previous studies aimed at fully accounting for idiosyncratic time-invariant initial conditions such as geography, cultural heritage or precolonial political institutions. However, we have found that the positive relationship between precolonial centralization and bureaucratic quality has become more pronounced over time. As a result, the initial level of bureaucratic quality would fail to control for the reassertion of precolonial political institutions in Africa from the late-1990s onwards. It is for this reason we control for precolonial centralization in our regression specification. Figure 2 provides a first indication of the relationship between precolonial centralization and aid dependence. It shows a negative relationship.[26] Consequently, the previous (small) literature studying the relationship between foreign aid and state capacity likely suffered from omitted variable bias by failing to control for precolonial centralization, and this may be true also for the (much larger) literature evaluating the impact of aid on various institutional features. Table 1 provides the summary statistics of our main variables for the level and changes analysis.

Figure 2: Relationship between Precolonial Centralization and Aid Dependence, 1984-2014



As a test of the robustness of our findings, we will then then subdivide our 30-year period into two sub-periods, 1984-1995 and 1996-2014. We split the sample in this way for the following reasons: During the 1990s, foreign aid to Africa was threatened by a complex crisis of legitimacy. Foreign aid was "facing its most severe crisis and the pressures for changes were greater than ever before. Aid agencies were beginning to experiment with new approaches" (van de Walle, 1999, p. 233). The end of the Cold War heralded the emergence of a new development paradigm among policymakers and international donor communities, and from the mid-1990s onwards foreign aid by Western donors and international organizations became increasingly oriented towards good governance and institutional

[26] The negative relationship between precolonial centralization and aid dependence also holds for different sub-periods (see Appendix B).

reform. A radical shift away from emphasizing physical infrastructure and the economic sectors towards the social sectors and capacity building took place (Broich & Szirmai, 2014; Burnside & Dollar, 2000; Dollar & Pritchett, 1998; World Bank, 1997). With this in mind, we find it sensible to split our sample before and after the mid-1990s and investigate whether the shift in development paradigm altered the relationships we estimate in this paper.

Table 1: Summary Statistics for the Main Variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
	Level Analysis				
Dependent Variables					
Bureaucratic Quality in 2014	37	1.30	0.77	0	2.50
Bureaucratic Quality in 1986	36	1.58	1.11	0	4
Bureaucratic Quality in 1984	25	1.14	1.15	0	4
Government Effectiveness in 2014	53	-0.80	0.66	-2.48	1.13
Government Effectiveness in 1996	52	-0.70	0.69	-2.10	0.88
Main Explanatory Variable					
Precolonial Political Centralization	48	0.59	0.33	0	1
Main Controls					
Aid as % of GDP, 1961-2013	53	14.45	9.73	0.12	41.46
Log GDP per capita, 1961-2013	53	6.60	1.01	5.06	9.14
External Violence, 1961-2013	51	0.05	0.13	0	0.75
Domestic Violence, 1961-2013	51	0.70	1.15	0	5.05
Oil Production Dummy, 1961-2013	53	0.26	0.39	0	1
British Colonial Legacy	53	0.42	0.50	0	1
French Colonial Legacy	53	0.38	0.49	0	1
Belgian Colonial Legacy	53	0.06	0.23	0	1
Portuguese Colonial Legacy	53	0.09	0.30	0	1
Spanish Colonial Legacy	53	0.02	0.14	0	1
British Legal Origin	53	0.34	0.48	0	1
French Legal Origin	53	0.66	0.48	0	1
Log Population Density, 1400	52	0.11	1.33	-2.30	3.04
Artificial State Borders (Partitioned Dimension)	41	0.48	0.31	0	1
	Changes Analysis				
Dependent Variable					
Δ Bureaucratic Quality, 1984-2014	36	0.03	1.29	-3	2.50
Main Explanatory Variable					
Precolonial Centralization	47	0.59	0.33	0	1
Aid as % of GDP, 1984-2013	51	7.18	5.83	0	24.02
Main Controls					
Initial Bureaucratic Quality, 1984	36	1.29	1.10	0	4
Δ Relative GDP per capita, 1984-2013	51	1.04	3.81	-0.52	27.05
Ethnic Tension, 1984-2013	36	2.80	0.98	1.00	5.18
Domestic Violence, 1984-2013	49	0.81	1.31	0	5.73
External Violence, 1984-2013	49	0.11	0.58	0	4.03
Oil Production Dummy, 1984-2013	51	0.32	0.44	0	1

4. Empirical Results

In section 4.1, we investigate the sources of contemporary bureaucratic quality on the African continent. In section 4.2, we examine the determinants of changes in bureaucratic quality over time.

4.1. Precolonial Centralization and State Capacity Levels

In Table 2 we report our OLS estimates for the determinants of contemporary state capacity in Africa. In our basic specification, column (1), precolonial centralization has a significant positive impact on bureaucratic quality in 2014. The estimated coefficient on precolonial centralization implies that a one standard deviation increase (s.d. = 0.77) in precolonial centralization translates, on average, into an expected change in bureaucratic quality by 1.01 points.

In the remaining columns, we control for other potential confounding factors. In column (3), we add the colonizer identity to the regressions. The non-colonized countries Ethiopia and Liberia serve as baseline group. The dummy for being a Belgian colony, which captures the Democratic Republic of Congo, is highly statistically significant and negative. With King Leopold II creating the Congo Free State in 1885 and colonizing the area as his private holding, the Democratic Republic of Congo serves as primary example of the extractive state (Hochschild, 1998; van Reybrouck, 2010). British colonial legacy is associated with better bureaucratic capacity. Controlling for geographical variables, the same is true for the French colonial legacy. In column (5) we add several proximate sources of bureaucratic capacity such as foreign aid dependence. Even though all control variables have their expected sign, the coefficients are not statistically significant. In column (7), we control for British legal origin where French legal origin serves as baseline category. We do not find empirical evidence that countries with a civil law system have lower state capacity than do countries with a common law system, contrasting what one might expect based on the findings of La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997, 1998, 1999). In column (9) and column (11), we control for initial population density in 1400 and artificial state characteristics proxied by our *partitioned* measure, respectively. Both coefficients are not statistically significant at any conventional significance level. More importantly, the addition of those control variables does not drastically change the estimated effect of precolonial centralization.

The even-numbered columns include a set of five geographic characteristics as controls. The results change little after controlling for geographic factors. We conduct an F-test on all geographic controls to see if the coefficients on our geographic factors are jointly significant. In all regression estimations, the F-statistic is very low. We therefore fail to reject the null hypothesis of no significant effect of our geographic variables. Overall, the results presented in Table 2 show a large and statistically significant effect of precolonial centralization on contemporary bureaucratic quality in Africa.

Table 2: Precolonial Centralization and Bureaucratic Quality in 2014, OLS Estimates

Dependent Variable: Bureaucratic Quality, 2014	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)	OLS (9)	OLS (10)	OLS (11)	OLS (12)
Precolonial Centralization	1.31***	1.30**	1.26***	1.30**	1.11**	1.22*	1.33***	1.37**	1.34***	1.29**	1.41***	1.64***
	(0.32)	(0.53)	(0.36)	(0.56)	(0.45)	(0.67)	(0.34)	(0.53)	(0.35)	(0.54)	(0.36)	(0.55)
British Colonial Legacy			0.52*	0.73**								
			(0.26)	(0.30)								
French Colonial Legacy			0.33	0.50**								
			(0.25)	(0.23)								
Belgian Colonial Legacy			-1.04***	-0.96**								
			(0.19)	(0.36)								
Portuguese Colonial Legacy			0.40	0.52								
			(0.38)	(0.40)								
Mean GDP per Capita, 61-13					0.13	0.23						
					(0.15)	(0.20)						
Mean Aid Dependence, 61-13					-0.98	-0.62						
					(1.21)	(1.52)						
Mean Domestic Violence, 61-13					-0.11	-0.12						
					(0.07)	(0.10)						
Mean External Violence, 61-13					0.91	0.71						
					(1.15)	(1.46)						
Oil Production Dummy, 61-13					-0.23	-0.47						
					(0.28)	(0.51)						
British Legal Origin							0.23	0.30				
							(0.22)	(0.27)				
Population Density in 1400									0.06	0.01		
									(0.09)	(0.16)		
Artificial State Borders (Partitioned Dimension)											0.25	0.38
											(0.43)	(0.46)
Constant	0.56**	0.70	0.22	-0.03	0.05	-0.69	0.45	0.50	0.52*	0.70	0.47	-0.12
	(0.24)	(0.70)	(0.23)	(0.67)	(0.96)	(1.68)	(0.28)	(0.72)	(0.26)	(0.71)	(0.36)	(0.69)
Observations	37	37	37	37	37	37	37	37	37	37	32	32
Geography Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.29	0.33	0.42	0.46	0.36	0.42	0.32	0.36	0.26	0.33	0.36	0.45
adj. R^2	0.27	0.20	0.33	0.26	0.24	0.16	0.28	0.21	0.30	0.17	0.31	0.29

Notes: The variables *GDP per capita* and *Population Density* are log transformed. Robust standard errors are shown in parentheses. ***denotes significance at the 1% level, ** at the 5% level, *at the 10% level. Geography controls are *Latitude*, *Log Mountainous Terrain*, *% of cultivated land in Köppen–Geiger climate zone A (humid climate with no winter)*, *% of cultivated land in Köppen–Geiger climate zone B (dry climate with no winter)* and *Mean distance to nearest coastline or sea-navigable river (km).*

We subsequently examine the relationship for an earlier period. When we regress the level of bureaucratic quality in 1986 (the first year we have data for all variables) against precolonial centralization, the coefficient on precolonial centralization is no longer statistically significant (Table 3).[27] Previous results by Gennaioli and Rainer (2006) seemed to suggest that the link between precolonial centralization and institutional quality has been persistent throughout the entire independence era. Our results, in contrast, do not support the notion of historical continuity in the effects of precolonial institutions. Interestingly, all the coefficients of the colonial dummies are statistically significant in 1986, suggesting a strong colonial legacy up until the mid-1980s. Thus the relationship between precolonial centralization and bureaucratic quality only surfaces in the more recent period. Our interpretation of the difference between the findings for 1986 and 2014 is that the influence of precolonial political institutions on modern state capacity is reasserting itself only recently, as the effects of the colonial interlude are fading. We performed additional regression estimations using the level of bureaucratic quality for intermediate years. Over time, the coefficient on precolonial centralization becomes larger and more statistically significant (see Table A.5 in Appendix A). This phenomenon will be further examined in section 4.2 where we focus on changes in bureaucratic quality.

4.2. Aid Dependence, Precolonial Centralization and Changes in State Capacity

In Table 4 we report our results for the full time period. In columns (1)-(5), we report the effect of foreign aid on bureaucratic quality without controlling for precolonial centralization. Columns (6)-(10) do control for precolonial centralization. Our results are intriguing. First, the negative relationship between foreign aid dependence and bureaucratic quality becomes weaker once we control for precolonial centralization. The magnitude of the coefficient declines and the level of significance is lower. Second, the precolonial centralization variable enters positively and statistically significantly in all our regression estimations. The effect remains robust after controlling for relative changes in GDP per capita, average levels of ethnic tensions, average levels of political violence and a dummy for oil production for the period under consideration. Overall, when controlling for precolonial centralization, the regression estimations explain between 77 percent and 80 percent of the variation in changes of bureaucratic quality over time.

[27] Even though the Bureaucratic Quality index published by the PRS Group covers the time period 1984-2014, the index is only available from 1986 onwards for several African countries. As a consequence thereof, we use bureaucratic quality in 1986 as dependent variable to cover more African countries. Results are, however, similar for the year 1984 and can be found in the online appendix.

Table 3: Precolonial Centralization and Bureaucratic Quality in 1986, OLS Estimates

Dependent Variable:	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Bureaucratic Quality, 1986	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Precolonial Centralization	0.28	-0.21	0.29	-0.18	-0.03	-0.60	0.25	-0.38	0.14	-0.18	0.52	0.11
	(0.65)	(0.83)	(0.60)	(0.89)	(0.58)	(0.85)	(0.68)	(0.81)	(0.66)	(0.84)	(0.64)	(0.93)
British Colonial Legacy			1.44***	1.29***								
			(0.33)	(0.41)								
French Colonial Legacy			1.91***	2.08***								
			(0.32)	(0.41)								
Belgian Colonial Legacy			0.93***	2.10***								
			(0.17)	(0.73)								
Portuguese Colonial Legacy			1.63***	1.38***								
			(0.29)	(0.34)								
Mean GDP per Capita, 61-86					0.65**	0.20						
					(0.28)	(0.30)						
Mean Aid Dependence, 61-86					-1.04	-2.16						
					(1.27)	(1.29)						
Mean Domestic Violence, 61-86					-0.10	-0.14						
					(0.12)	(0.10)						
Mean External Violence, 61-86					1.31	-0.42						
					(0.86)	(1.21)						
Oil Production, 61-86					-0.70	0.52						
					(0.58)	(0.67)						
British Legal Origin							-0.31	-0.66*				
							(0.41)	(0.34)				
Population Density in 1400									-0.25	-0.13		
									(0.18)	(0.20)		
Artificial State Borders											0.22	0.36
(Partitioned Dimension)											(0.58)	(0.55)
Constant	1.43***	2.63**	-0.12	1.07	-2.23	1.75	1.57***	3.09***	1.61***	2.61**	1.33**	1.84
	(0.41)	(1.20)	(0.27)	(0.99)	(1.83)	(2.49)	(0.49)	(1.04)	(0.45)	(1.19)	(0.52)	(1.39)
Observations	36	36	36	36	36	36	36	36	36	36	31	31
Geography Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.01	0.23	0.17	0.44	0.23	0.44	0.03	0.30	0.05	0.23	0.03	0.26
adj. R^2	-0.02	0.07	0.04	0.22	0.07	0.18	-0.03	0.13	-0.01	0.04	-0.04	0.04

Notes: The variables *GDP per capita* and *Population Density* are log transformed. Robust standard errors are shown in parentheses. ***denotes significance at the 1% level, ** at the 5% level, *at the 10% level. Geography controls are *Latitude*, *Log Mountainous Terrain*, *% of cultivated land in Köppen–Geiger climate zone A (humid climate with no winter)*, *% of cultivated land in Köppen–Geiger climate zone B (dry climate with no winter)* and *Mean distance to nearest coastline or sea-navigable river (km).*

Table 4: Aid Dependence, Precolonial Centralization and Change in Bureaucratic Quality, 1984-2014, OLS Estimates

	Dependent Variable: Δ Bureaucratic Quality, 1984-2014									
	Not Controlling for Precolonial Centralization					Controlling for Precolonial Centralization				
	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)	OLS (9)	OLS (10)
Mean Aid Dependence, 1984-2013	-5.55***	-5.11***	-4.95***	-4.65***	-6.91***	-3.03*	-3.10	-3.18*	-2.81	-4.78*
	(1.63)	(1.53)	(1.38)	(1.49)	(1.82)	(1.74)	(1.91)	(1.71)	(1.73)	(2.35)
Precolonial Centralization						1.15***	1.01**	0.90*	1.00**	0.99**
						(0.38)	(0.44)	(0.45)	(0.44)	(0.43)
Initial Bureaucratic Quality	-1.01***	-1.00***	-1.06***	-1.08***	-1.00***	-1.01***	-1.01***	-1.06***	-1.07***	-1.01***
	(0.12)	(0.11)	(0.11)	(0.12)	(0.10)	(0.09)	(0.09)	(0.10)	(0.10)	(0.09)
Δ Relative GDP per capita, 1984-2013		0.30*	0.15	0.29*	0.29*		0.15	0.04	0.14	0.15
		(0.16)	(0.15)	(0.16)	(0.15)		(0.17)	(0.14)	(0.16)	(0.15)
Mean Ethnic Tensions, 1984-2013			-0.27**					-0.23*		
			(0.11)					(0.12)		
Mean Domestic Violence, 1984-2013				-0.15**					-0.15**	
				(0.07)					(0.07)	
Mean External Violence, 1984-2013				0.17**					0.07	
				(0.08)					(0.07)	
Oil Production Dummy, 1984-2013					-0.38					-0.35
					(0.30)					(0.30)
Constant	1.69***	1.52***	2.41***	1.72***	1.80***	0.89**	0.90**	1.71***	1.10***	1.17**
	(0.24)	(0.24)	(0.42)	(0.25)	(0.33)	(0.36)	(0.38)	(0.56)	(0.38)	(0.45)
Observations	36	36	36	36	36	36	36	36	36	36
R^2	0.70	0.73	0.76	0.76	0.74	0.77	0.77	0.79	0.80	0.78
adj. R^2	0.68	0.70	0.73	0.71	0.70	0.74	0.74	0.76	0.75	0.75

Notes: Robust standard errors are shown in parentheses. ***denotes significance at the 1% level, ** at the 5% level, *at the 10% level.

The next step in the analysis is to split the period into two sub-periods – 1984-1995 and 1995-2014 – in order to see whether the relationships differ between the sub-periods. Table 5 repeats the analysis of Table 4 for the period 1984-1995. When controlling for precolonial centralization, the coefficient on foreign aid dependence remains stable and statistically significant. However, the coefficient on precolonial centralization is no longer statistically significant.

Next, we look at the relationship between aid dependence and bureaucratic quality for the second sub-period (Table 6). When controlling for precolonial centralization, the negative relationship between foreign aid dependence and bureaucratic quality weakens considerably and is no longer statistically significant in any of the five specifications. In contrast to the earlier sub-period, we document a positive and statistically significant relationship between precolonial centralization and changes in bureaucratic quality. This implies that, on average, countries with highly centralized precolonial institutions improved their bureaucratic quality between 1996 and 2014 more than countries that had highly decentralized precolonial political systems. Additionally, relative to historical influences, aid dependence appears to be less important than both aid pessimists and conditional optimists would argue, at least in terms of its effect on state capacity.

The strongly positive relationship between precolonial centralization and improvements in bureaucratic quality over the full time period is mainly driven by the positive relationship between precolonial centralization and improvements in bureaucratic quality in the later period. The negative relationship between foreign aid dependence and deteriorations in bureaucratic quality over the full time period is mainly driven by the negative relationship between foreign aid dependence and deteriorations in bureaucratic quality in the early period.

Burnside and Dollar (2000) have argued for a policy-conditional effect of aid on growth, meaning that the returns to aid are bigger in recipient countries with better institutions. The positive effects of the Marshall aid program after the Second World War, for example, are partly attributed to the well-functioning institutions in the Western European recipient countries (Behrman, 2007). We propose a modified version of the Burnside-Dollar hypothesis, applying it to bureaucratic capacity rather than to economic growth. In our modified Burnside-Dollar hypothesis, we test the hypothesis that foreign aid will improve bureaucratic capacity in a recipient country if the initial level of bureaucratic quality is higher. We interact mean aid dependence with the initial level of bureaucratic quality in 1996. A significant positive coefficient of the interaction term is interpreted as supporting the hypothesis. Due to limitations of space, we only focus on the second sub-period 1996-2014, the period in which Western donors have increasingly emphasized the crucial importance of institutional quality and good governance.

Table 5: Aid Dependence, Precolonial Centralization and Change in Bureaucratic Quality, 1984-1995, OLS Estimates

	Dependent Variable: Δ Bureaucratic Quality, 1984-1995									
	Not Controlling for Precolonial Centralization					Controlling for Precolonial Centralization				
	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)	OLS (9)	OLS (10)
Mean Aid Dependence, 1984-1995	-4.33***	-4.48***	-4.48***	-4.43***	-3.27**	-4.00**	-4.61***	-4.61***	-4.49***	-3.44*
	(1.30)	(1.11)	(1.13)	(1.18)	(1.43)	(1.61)	(1.55)	(1.57)	(1.63)	(1.78)
Precolonial Centralization						0.24	-0.09	-0.09	-0.04	-0.13
						(0.57)	(0.59)	(0.60)	(0.60)	(0.56)
Initial Bureaucratic Quality	-0.60***	-0.64***	-0.63***	-0.64***	-0.65***	-0.60***	-0.64***	-0.63***	-0.64***	-0.65***
	(0.12)	(0.13)	(0.13)	(0.13)	(0.13)	(0.12)	(0.13)	(0.13)	(0.14)	(0.13)
Δ Relative GDP per capita, 1984-1995		0.81	0.82	0.77	0.95**		0.85	0.87	0.79	1.01*
		(0.49)	(0.60)	(0.51)	(0.46)		(0.54)	(0.61)	(0.56)	(0.52)
Mean Ethnic Tensions, 1984-1995			0.01					0.01		
			(0.14)					(0.14)		
Mean Domestic Violence, 1984-1995				-0.05					-0.04	
				(0.05)					(0.05)	
Mean External Violence, 1984-1995				1.21					1.25	
				(1.21)					(1.11)	
Oil Production Dummy, 1984-1995					0.42					0.43
					(0.32)					(0.32)
Constant	1.37***	1.48***	1.45***	1.53***	1.26***	1.21**	1.54***	1.51*	1.56***	1.35**
	(0.24)	(0.24)	(0.52)	(0.27)	(0.32)	(0.47)	(0.53)	(0.80)	(0.55)	(0.57)
Observations	36	36	36	36	36	36	36	36	36	36
R^2	0.46	0.51	0.51	0.51	0.53	0.47	0.51	0.51	0.51	0.54
adj. R^2	0.43	0.46	0.44	0.43	0.47	0.42	0.44	0.43	0.41	0.46

Notes: Robust standard errors are shown in parentheses. ***denotes significance at the 1% level, ** at the 5% level, *at the 10% level.

Table 6: Aid Dependence, Precolonial Centralization and Change in Bureaucratic Quality, 1996-2014, OLS Estimates

	Dependent Variable: Δ Bureaucratic Quality, 1996-2014									
	Not Controlling for Precolonial Centralization					Controlling for Precolonial Centralization				
	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)	OLS (9)	OLS (10)
Mean Aid Dependence, 1996-2013	-3.63**	-4.63	-3.88	-4.39	-7.31**	-1.12	-1.36	-1.42	-1.60	-3.93
	(1.71)	(2.94)	(2.63)	(2.78)	(3.41)	(2.11)	(3.24)	(3.15)	(3.11)	(3.77)
Precolonial Centralization						1.06**	1.05**	0.86**	0.95**	1.02**
						(0.39)	(0.41)	(0.41)	(0.42)	(0.40)
Initial Bureaucratic Quality	-0.75***	-0.77***	-0.80***	-0.81***	-0.74***	-0.75***	-0.76***	-0.79***	-0.80***	-0.73***
	(0.14)	(0.14)	(0.15)	(0.17)	(0.14)	(0.12)	(0.13)	(0.14)	(0.15)	(0.13)
Δ Relative GDP per capita, 1996-2013		0.10	0.04	0.06	0.18		0.02	-0.01	-0.00	0.10
		(0.16)	(0.13)	(0.14)	(0.15)		(0.14)	(0.13)	(0.13)	(0.15)
Mean Ethnic Tensions, 1996-2013			-0.24**					-0.17*		
			(0.09)					(0.10)		
Mean Domestic Violence, 1996-2013				-0.15**					-0.13**	
				(0.06)					(0.06)	
Mean External Violence, 1996-2013				0.69					0.40	
				(0.52)					(0.53)	
Oil Production Dummy, 1996-2013					-0.48*					-0.45*
					(0.24)					(0.25)
Constant	1.12***	1.15***	1.82***	1.32***	1.43***	0.39	0.40	1.02*	0.65	0.68
	(0.32)	(0.32)	(0.47)	(0.41)	(0.42)	(0.38)	(0.41)	(0.54)	(0.47)	(0.49)
Observations	37	37	37	37	37	37	37	37	37	37
R^2	0.50	0.50	0.58	0.57	0.54	0.60	0.60	0.64	0.65	0.64
adj. R^2	0.47	0.46	0.52	0.50	0.49	0.57	0.57	0.58	0.58	0.58

Notes: Robust standard errors are shown in parentheses. ***denotes significance at the 1% level, ** at the 5% level, *at the 10% level.

We find some evidence for the modified Burnside-Dollar hypothesis when not controlling for precolonial centralization (Table 7). However, when controlling for precolonial centralization we no longer find any empirical support for the modified Burnside-Dollar hypothesis in this period. Once again, we do find a strong positive relationship between precolonial centralization and improvements in bureaucratic quality.[28] Our results indicate that precolonial centralization "trumps" foreign aid dependence when trying to explain changes in bureaucratic quality on the African continent for the period 1996-2014.

In this section we have documented a strong link between precolonial centralization and bureaucratic quality. For both the entire period 1984-2014 and the sub-period 1996-2014, the aid dependence variable loses most of its explanatory power when controlling for precolonial centralization. The positive relationship between precolonial centralization and changes in bureaucratic quality survives additional controls for the periods 1984-2014 and 1996-2014. For the early period, however, the strong and positive link between the two variables is not visible. When controls are added, there is no significant relationship between precolonial centralization and changes in bureaucratic quality for the time period 1984-1995 either.

In sum, our empirical findings lend support for the historical persistence of the effects of indigenous political institutions in Africa. Our interpretation of the findings presented above is that with the arrival of colonialism on the African continent, new colonial institutions were superimposed on pre-existing precolonial institutions. In the early years of independence, the colonial institutions had a strong influence on bureaucratic institutions and capabilities. While a majority of African countries officially gained independence in the 1960s, most of them were still profoundly vulnerable to external political and economic pressures during the entire postcolonial era (Meredith, 2005). In fact, a bulk of African countries found themselves struggling for true independence until the early 1990s. Worsening economic conditions, political crises, macroeconomic instability and the emerging debt crisis engulfed the majority of African countries in the 1980s. When the democratic wave swept across Africa in the 1990s as a result of the fall of communist regimes and the cessation of the Cold War, a majority of African countries slowly witnessed more varieties of freedom – press freedom, freedom of speech, freedom of movement and freedom of organization. As years passed, the temporary colonial influences faded and precolonial institutions reasserted their importance and increasingly came to shape bureaucratic quality. On average, countries with high precolonial political centralization witnessed an improvement in bureaucratic quality, while countries with highly fragmented precolonial political systems suffered from a decline in administrative capacity. Overall, our results highlight the historical legacy of the precolonial bureaucratic state in Africa.

[28] The results for the full period and early period are presented in the online appendix.

Table 7: Aid Dependence and Change in Bureaucratic Quality, Controlling for Initial Conditions, 1996-2014, OLS Estimates

	Dependent Variable: Δ Bureaucratic Quality, 1996-2014									
	Not Controlling for Precolonial Centralization					Controlling for Precolonial Centralization				
	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)	OLS (9)	OLS (10)
Mean Aid Dependence, 1996-2013	-5.33***	-8.70***	-7.54**	-7.30**	-10.30***	-1.60	-2.74	-3.18	-1.68	-4.26
	(1.85)	(3.09)	(2.97)	(3.49)	(3.45)	(1.88)	(3.95)	(3.87)	(3.91)	(4.15)
Precolonial Centralization						1.03**	0.97**	0.75	0.94**	1.00**
						(0.40)	(0.46)	(0.46)	(0.46)	(0.44)
Initial Bureaucratic Quality	-0.85***	-0.94***	-0.96***	-0.93***	-0.89***	-0.78***	-0.81***	-0.85***	-0.80***	-0.75***
	(0.15)	(0.16)	(0.16)	(0.19)	(0.14)	(0.12)	(0.14)	(0.15)	(0.16)	(0.14)
Mean Aid Dependence, 1996-2013	2.58	4.07*	3.62	2.82	3.36*	0.61	1.13	1.45	0.07	0.30
x Initial Bureaucratic Quality	(1.72)	(2.08)	(2.30)	(2.09)	(1.97)	(1.86)	(2.30)	(2.40)	(2.28)	(2.26)
Δ Relative GDP per capita, 1996-2013		0.24	0.17	0.16	0.28		0.07	0.05	0.00	0.11
		(0.16)	(0.15)	(0.16)	(0.16)		(0.17)	(0.16)	(0.16)	(0.17)
Mean Ethnic Tensions, 1996-2013			-0.23**					-0.17*		
			(0.09)					(0.10)		
Mean Domestic Violence, 1996-2013				-0.13**					-0.13*	
				(0.06)					(0.07)	
Mean External Violence, 1996-2013				0.52					0.40	
				(0.53)					(0.55)	
Oil Production Dummy, 1996-2013					-0.42*					-0.44
					(0.24)					(0.27)
Constant	1.22***	1.36***	1.97***	1.46***	1.56***	0.43	0.51	1.18*	0.65	0.71
	(0.33)	(0.33)	(0.46)	(0.42)	(0.41)	(0.38)	(0.46)	(0.59)	(0.51)	(0.50)
Observations	37	37	37	37	37	37	37	37	37	37
R^2	0.51	0.54	0.60	0.58	0.57	0.60	0.61	0.64	0.65	0.64
adj. R^2	0.47	0.48	0.54	0.50	0.50	0.55	0.54	0.57	0.56	0.57

Notes: Robust standard errors are shown in parentheses. ***denotes significance at the 1% level, ** at the 5% level, *at the 10% level.

5. Robustness

This section presents some additional robustness checks. Section 5.1 presents results for the level analysis when using an alternative indicator as rough proxy for administrative state capacity. Section 5.2 addresses potential endogeneity problems with regard to our level analysis. Section 5.3 tackles endogeneity concerns with regard to our analysis of changes in bureaucratic quality.

5.1. Government Effectiveness as Alternative Dependent Variable

In this section, we check whether the results depend on the specific measure of state capacity that we have selected. We do this with additional regressions using the World Bank measure of *Government Effectiveness* from the World Governance indicators as our dependent variable in the level analysis. This indicator is available for almost all 54 African countries (except for South Sudan), but for a shorter period (1996-2014). Similar to the bureaucratic quality measure, we use the starting value and the end value of the government effectiveness indicator as our dependent variable. Both for the years 1996 and 2014, we find that the results with the alternative measure are perfectly consistent with our previous findings. The relationship between precolonial centralization and government effectiveness is strongly positive (Tables C.1 and C.2 in Appendix C), which suggests that our results hold for a broader range of measures of administrative effectiveness.

5.2. 2SLS Estimates for Level Analysis

Our previous OLS estimates may suffer from endogeneity bias. First, the positive relationship between precolonial centralization and bureaucratic quality might be driven by omitted variable bias. Time-variant non-observable factors may have driven both precolonial state formation and contemporary state capacity, potentially producing misleading cross-country estimates. Second, Murdock's (1967) classification of precolonial centralization as proxy for the level of ancient statehood is subject to the critique that it may contain sizeable measurement error (Michalopoulos & Papaioannou, 2015). In order to tackle the endogeneity problems, we instrument precolonial centralization with the TseTse fly suitability index (TSI) developed by Alsan (2015). She argues that ethnic groups inhabiting TseTse suitable areas were less likely to be politically centralized at the regional level. In her empirical study, Alsan constructs the TSI at the regional level. In contrast to Alsan, we construct a TSI at the national level. The construction of the national TSI indicator as well as the TSI values for the sample countries are documented in Appendix A (Table A.6).

Table 8: Precolonial Centralization and Bureaucratic Quality in 2014, 2SLS Estimates

Dependent Variable:	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Bureaucratic Quality, 2014	(1)	(2)	(3)	(4)	(5)	(6)
Precolonial Centralization	1.74***	1.45***	1.46**	1.68***	1.76***	1.50***
	(0.62)	(0.56)	(0.72)	(0.60)	(0.65)	(0.58)
British Colonial Legacy		0.43*				
		(0.22)				
French Colonial Legacy		0.33				
		(0.23)				
Belgian Colonial Legacy		-1.08***				
		(0.16)				
Portuguese Colonial Legacy		0.38				
		(0.36)				
Mean GDP per Capita, 61-13			0.10			
			(0.14)			
Mean Aid Dependence, 61-13			-0.83			
			(1.39)			
Mean Domestic Violence, 61-13			-0.11			
			(0.07)			
Mean External Violence, 61-13			0.44			
			(1.27)			
Oil Production Dummy, 61-13			-0.19			
			(0.26)			
British Legal Origin				0.18		
				(0.22)		
Population Density in 1400					0.04	
					(0.10)	
Artificial State Borders						0.21
(Partitioned Dimension)						(0.00)
Constant	0.30	0.14	0.03	0.25	0.27	0.41
	(0.42)	(0.26)	(0.95)	(0.45)	(0.44)	(0.46)
Observations	35	35	35	35	35	31
F-statistic, first stage	14.30	12.06	7.28	13.68	11.88	13.74
Wooldridge's heteroskedasticity-robust	.435	.071	.258	.368	.435	.015
score test (p-value in brackets)	(0.510)	(0.790)	(0.611)	(0.544)	(0.510)	(0.903)

Notes: The variables *GDP per capita* and *Population Density* are log transformed. Robust standard errors are shown in parentheses. ***denotes significance at the 1% level, ** at the 5% level, *at the 10% level. The instrument for precolonial centralization is the "national" TSI which is constructed by the authors.

Table 8 reports the 2SLS estimates. The first stage regressions results are excluded due to limited space but are available upon request. The precolonial centralization coefficient in column (2) remains highly statistically significant and is in fact larger than the OLS estimate reported in Table 2. This may therefore suggest that the coefficient of precolonial centralization in the uninstrumented regression suffered from attenuation bias (Wooldridge, 2002). The attenuation bias resulting from measurement error in the precolonial centralization variable would therefore be more important than

omitted variable bias.[29] The positive link between precolonial statehood and contemporary state capacity remains intact after adding several other control variables.[30]

In all but one case, the instrument we rely on is strong, since our first-stage F-statistics exceed the rule-of-thumb threshold of 10 (Staiger & Stock, 1997; Stock & Watson, 2012). We cannot answer the question whether our instrument meets the exogeneity condition. As our regression coefficients are exactly identified, we cannot deploy a test of overidentifying restrictions. We can, however, test whether or not precolonial centralization or one of the other explanatory variables are highly endogenous.[31] In all six cases, Wooldridge's score test fails to reject the null hypothesis that our variable precolonial centralization is exogenous at all conventional significance levels.[32] If the endogenous regressor is in fact exogenous, then the OLS estimator is more efficient. Our econometric analysis shows that our concerns with regard to endogeneity are to a large extent unwarranted. Based on this analysis, we will treat precolonial centralization as exogenous for the rest of the analysis.

5.3. 2SLS Estimates for Changes Analysis

In this section we address the endogeneity problem between foreign aid dependence and changes in bureaucratic quality. On the one hand, more aid could flow to countries with conditions impeding institutional change, as there is no evidence that less corrupt government or less authoritarian regimes receive more aid (Alesina & Dollar, 2000; Alesina & Weder, 2002). On the other hand, foreign aid may predominantly flow to countries whose bureaucratic capacity is improving as the return of aid is biggest in a sound institutional environment (Burnside & Dollar, 1997, 2000). In order to correct for potential reverse causality, we need to instrument for foreign aid dependence.

One of our instruments is population size. Population size captures the strategic interests of donor countries, as "there is an exogenous small country bias in aid such that smaller countries get higher aid per capita and higher aid as ratio to their income" (Easterly, 2009, p. 388). Knack and Rahman (2007) show that the relationship between population size and bureaucratic quality is both theoretically and empirically weak. This suggests that our first instrument may satisfy the relevance and exogeneity condition. Our second instrument is the initial development level, proxied by GDP per capita (log transformed). This instrument captures needs-based preferences and altruistic motives of

[29] Endogeneity problems due to simultaneity bias/reverse causality are obviously of little concern here.
[30] Additional 2SLS results using alternative control variables can be found in the online appendix.
[31] The most commonly used test is the Hausman test (Hausman, 1978). Since the Hausman test assumes homoskedasticity of the residuals, we used Wooldridge's (1995) heteroskedasticty-robust score test instead. The test score and the associated p-value are reported in **Error! Reference source not found.** as well.
[32] Assuming homoskedasticity, we deploy the Durbin and Wu–Hausman tests as well for all six regression specifications. Both tests arrive at the same conclusion that precolonial centralization can be treated as exogenous. The results are available upon request.

aid. Generally, more development assistance goes to poor countries (Riddell, 2007).[33] Since the two variables are uncorrelated among themselves, any linear combination is valid as well.[34] Using a linear combination of the two also allows us to deploy the test of overidentifying restrictions, which tests whether our instruments are purely exogenous. As mentioned before, we will not instrument for precolonial centralization, as we think this variable can be considered exogenous.[35]

Table 9 presents our 2SLS estimates for the changes analysis covering the full period. In the base specification (column 1), the coefficient on aid dependence is negative but not statistically significant. In contrast, however, and similar to our OLS estimates, the coefficient on precolonial centralization is positive and statistically significant. Our empirical results remain intact after including our usual control variables. In four out of five cases, the instruments we rely on appear to be valid. The first stage F-statistics are always above the critical rule-of-thumb threshold of 10, except in column (5). Moreover, our instruments appear to satisfy the exogeneity assumption as can be interpreted from the high p values for the Hansen's J-test of overidentification. In all cases, we fail to reject the null hypothesis that our two instruments are exogenous.

We now interpret the results for the two sub-periods (Table 10). While the aid coefficient is strongly negative and highly statistically significant in the early period, the effect of foreign aid on bureaucratic capacity remains ambiguous for the later period. Moreover, the negative effect of foreign aid on bureaucratic quality for the period 1984-1995 is now a lot stronger if compared to our OLS estimates in Table 5. The relationship between precolonial centralization and the change in state

[33] Both the population data and the GDP per capita data come from Maddison (2010) and from the World Development Indicators. Ideally, we would like to use the initial population size and the initial development level for the period under consideration as instruments. We find, however, that population size at the beginning of the decade of the period under consideration is a much stronger instrument for aid dependence than initial population size. This result is perhaps surprising and we do not have an intuitive explanation for it. We therefore use the initial development level and population size at the beginning of the decade of the period under consideration as instruments for aid dependence.

[34] The correlation between log GDP per capita in 1984 and population in 1980 is -0.072 and is not statistically significant at all conventional significance levels. In a similar way, the correlation between log GDP per capita in 1996 and population in 1990 is -0.098 and not statistically significant at all conventional significance levels.

[35] While we believe that these instrumental variables are reasonable in the context of regressions where bureaucratic capacity is the outcome variable, we cannot fully guarantee the validity of our instruments, and we wish to emphasize that we think of the estimates in this section merely as checks on the robustness of the OLS estimates. We considered novel instruments for foreign aid, along the lines of Dreher, Eichenauer and Gehring (2013), Galiani, Knack, Xu and Zou (2014) as well as Nunn and Qian (2014), but we did not find them suitable for the following reasons: First, the aforementioned authors instrument for foreign aid over time intervals of shorter lengths than used here, and their instrumental variables are better suited for regressions based on such (shorter) time-spans. More specifically, their studies use panel data with time periods between one and four years, while we work with significantly longer time-spans. Second, the contributions by Dreher et al. (2013) and Galiani et al. (2014) in particular investigate the effect of foreign aid on economic growth, while the study by Nunn and Qian (2014) examines the relationship between food aid from the United States exclusively and conflict in the recipient country. Our paper, however, discusses the impact of foreign aid on bureaucratic capacity, a fundamentally different concept.

capacity for the two-sub periods is similar to the OLS estimates in Table 5 and Table 6. Our main findings change very little after including other control variables. The first stage F-statistics are more often than not above the critical rule-of-thumb threshold of 10. In all cases, we once again fail to reject the null hypothesis that our two instruments are exogenous.

Table 9: Aid Dependence, Precolonial Centralization and Change in Bureaucratic Quality, 1984-2014, 2SLS Estimates

Dependent Variable:	2SLS	2SLS	2SLS	2SLS	2SLS
Δ Bureaucratic Quality, 1984-2014	(1)	(2)	(3)	(4)	(5)
Mean Aid Dependence, 1984-2013	-1.29	-2.08	-1.36	-1.87	-5.43
	(2.92)	(3.03)	(2.49)	(2.33)	(5.50)
Precolonial Centralization	1.28***	1.09**	1.07**	1.19***	1.08**
	(0.44)	(0.48)	(0.43)	(0.38)	(0.51)
Initial Bureaucratic Quality	-1.00***	-1.00***	-1.04***	-1.06***	-1.02***
	(0.09)	(0.08)	(0.08)	(0.09)	(0.08)
Δ Relative GDP per capita, 1984-2013		0.15			
		(0.16)			
Mean Ethnic Tensions, 1984-2013			-0.23**		
			(0.11)		
Mean Domestic Violence, 1984-2013				-0.15**	
				(0.07)	
Mean External Violence, 1984-2013				0.05	
				(0.06)	
Oil Production Dummy, 1984-2013					-0.40
					(0.44)
Constant	0.68	0.78*	1.52***	0.99***	1.26
	(0.45)	(0.45)	(0.56)	(0.36)	(0.79)
Observations	36	36	36	36	36
F statistic, first stage	14.57	19.79	11.69	11.45	3.28
Overidentifying restrictions,	1.271	1.760	0.122	0.504	2.010
J-test and *p*-value	(0.259)	(0.185)	(0.727)	(0.478)	(0.156)

Notes: Robust standard errors in parentheses. ***denotes significance at the 1% level, ** at the 5% level, *at the 10% level. Instruments in 2SLS for the period 1984-2014 and 1984-1995 include population in 1980 and initial log GDP per capita. Instruments in 2SLS for the period 1996-2014 include population in 1990 and initial log GDP per capita.

Table 10: Aid Dependence, Precolonial Centralization and Change in Bureaucratic Quality, 2SLS Estimates

Dependent Variable:	2SLS					2SLS				
Δ Bureaucratic Quality	1984-1995					1996-2014				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mean Aid Dependence	-8.23**	-10.04***	-8.16**	-8.40**	-10.44*	1.36	2.19	2.12	-0.28	-1.93
	(3.31)	(3.23)	(3.31)	(3.49)	(5.67)	(3.30)	(4.17)	(3.40)	(3.07)	(3.83)
Precolonial Centralization	-0.12	-0.68	-0.18	-0.12	-0.26	1.19***	1.21***	1.06***	1.02**	1.09***
	(0.58)	(0.57)	(0.60)	(0.59)	(0.77)	(0.40)	(0.42)	(0.40)	(0.40)	(0.39)
Initial Bureaucratic Quality	-0.63***	-0.68***	-0.64***	-0.64***	-0.63***	-0.68***	-0.67***	-0.68***	-0.76***	-0.70***
	(0.11)	(0.12)	(0.12)	(0.12)	(0.12)	(0.13)	(0.14)	(0.14)	(0.14)	(0.14)
Δ Relative GDP per capita		1.21**					-0.09			
		(0.57)					(0.16)			
Mean Ethnic Tensions			-0.10					-0.16*		
			(0.12)					(0.09)		
Mean Domestic Violence				-0.05					-0.13**	
				(0.07)					(0.06)	
Mean External Violence				1.35					0.40	
				(1.24)					(0.49)	
Oil Production Dummy					-0.26					-0.38
					(0.40)					(0.25)
Constant	1.79***	2.39***	2.13***	1.86***	2.14**	0.06	0.02	0.50	0.47	0.50
	(0.55)	(0.57)	(0.77)	(0.60)	(1.00)	(0.47)	(0.48)	(0.59)	(0.46)	(0.56)
Observations	36	36	36	36	36	37	37	37	37	37
F statistic, first stage	10.29	11.44	10.07	9.44	4.73	16.87	19.83	17.06	15.93	11.05
Overidentifying restrictions,	0.266	0.058	0.800	0.707	0.168	0.366	0.133	0.118	0.059	0.064
J-test and *p*-value	(0.606)	(0.809)	(0.371)	(0.401)	(0.682)	(0.545)	(0.715)	(0.731)	(0.808)	(0.800)

Notes: Robust standard errors in parentheses. ***denotes significance at the 1% level, ** at the 5% level, *at the 10% level. Instruments in 2SLS for the period 1984-1995 include population in 1980 and initial log GDP per capita. Instruments in 2SLS for the period 1996-2014 include population in 1990 and initial log GDP per capita.

6. Concluding Remarks

In this paper we have empirically examined the ultimate and proximate determinants of contemporary state capacity in Africa. Our paper provides two key contributions. First, we have found that precolonial institutions strongly predict the *level* of bureaucratic capacity of current-day states. The positive relationship between precolonial statehood and contemporary state capacity, however, becomes less strong and less statistically significant the further we go back in time (and the closer we get to the colonial period). Second, when assessing *changes* in bureaucratic quality over time, the inclusion of precolonial centralization in our econometric analysis nullifies the estimated negative impact of foreign aid in recent years. Aid dependence no longer has a significant influence on changes in bureaucratic quality. Hence, our results suggest that previous studies examining the link between aid and institutional quality in Africa may have suffered from omitted variables bias by not including measures of precolonial experience.

Our work is closely related to a set of papers that find historical continuity of indigenous political institutions in Africa (Gennaioli & Rainer, 2006). However, in contrast to earlier studies, we find that the strong link between precolonial centralization and modern institutional and political capabilities in Africa has only emerged from the late-1990s onwards. In many African countries, colonial institutions were superimposed upon deeper institutional foundations. The postcolonial institutions resulting from colonial state legacies were often incongruent with precolonial systems. As the colonial period is slowly fading, the influence of precolonial political institutions on modern state capacity is reasserting itself. The empirical findings presented in this paper thus highlight the historical legacy of the precolonial bureaucratic state in Africa, and provide further evidence for the importance of precolonial centralization in our understanding of present day economic and political developments on the continent (Gennaioli & Rainer, 2006, 2007; Michalopoulos & Papaioannou, 2013, 2014, 2015; Osafo-Kwaako & Robinson, 2013).

Our quantitative empirical work calls for further research, both theoretical and empirical. While it appears clear from our findings that contemporary institutional development on the African continent has deep historical roots, the channels through which these roots shape modern states are less clear. A rich understanding of these channels is going to require a combination of quantitative and qualitative analysis, ideally accompanied by theory-development. In particular, we believe that future fieldwork and case studies will paint a more complete picture of the trajectory of institutional development and state capacity in Africa from precolonial times until today.

Appendix A: DESCRIPTIVE STATISTICS

Table A.1: Bureaucratic Quality and Government Effectiveness Index – Country Sample

Country	BQ index	GE index	Country	BQ index	GE index
Algeria	x	x	Libya	x	x
Angola	x	x	Madagascar	x	x
Benin		x	Malawi	x	x
Botswana	x	x	Mali	x	x
Burkina Faso	x	x	Mauritania		x
Burundi		x	Mauritius		x
Cameroon	x	x	Morocco	x	x
Cape Verde		x	Mozambique	x	x
Central African Republic		x	Namibia	x	x
Chad		x	Niger	x	x
Comoros		x	Nigeria	x	x
Congo Republic	x	x	Rwanda		x
Cote d'Ivoire	x	x	Sao Tome and Principe		x
Dem. Rep. Congo	x	x	Senegal	x	x
Djibouti		x	Seychelles		x
Egypt	x	x	Sierra Leone	x	x
Equatorial Guinea		x	Somalia	x	x
Eritrea		x	South Africa	x	x
Ethiopia	x	x	South Sudan		
Gabon	x	x	Sudan	x	x
Gambia	x	x	Swaziland		x
Ghana	x	x	Tanzania	x	x
Guinea	x	x	Togo	x	x
Guinea-Bissau	x	x	Tunisia	x	x
Kenya	x	x	Uganda	x	x
Lesotho		x	Zambia	x	x
Liberia	x	x	Zimbabwe	x	x

Note: "x" indicates that the index is available for the respective country. The bureaucratic quality index is available for 37 African countries. The government effectiveness index is available for all African countries, except for South Sudan.

Table A.2: Bureaucratic Quality in Africa – Across Countries and Over Time

Country	Average Bureaucratic Quality, 1984-2014	Country	Change in Bureaucratic Quality, 1984-2014
	High performing countries		
South Africa	2.83	Ghana	2.50
Kenya	2.39	Botswana†	2.00
Namibia*	2.36	Gambia‡	2.00
Botswana†	2.24	Guinea	2.00
Ghana	2.18	Namibia*	2.00
Zimbabwe	2.14	Uganda	2.00
Gabon	2.13	Ethiopia†	1.50
Morocco	2.09	Guinea-Bissau‡	1.50
Tunisia	2.00	Malawi	1.50
Egypt	1.97	Niger†	1.50
	Low performing countries		
Zambia	0.98		
Ethiopia†	0.78	Gabon	-0.17
Tanzania	0.75	Morocco	-0.42
Sudan	0.74	Angola	-0.50
Sierra Leone†	0.48	Zimbabwe	-0.83
Togo	0.44	Cameroon	-0.92
Dem. Rep. Congo	0.38	Senegal	-1.00
Somalia†	0.16	Togo	-1.00
Liberia	0.00	South Africa	-2.00
Mali	0.00	Cote d'Ivoire	-3.00

Note: † refers to period 1985-2014; ‡ refers to period 1986-2014; * refers to period 1990-2014.
Source: Own calculations based on data from the PRS Group's International Country Risk Guide (ICRG).

Table A.3: Ranking of the Largest and Smallest Aid Recipients in Africa, 1984-2014

Country	Average ODA/GDP (%)	Country	Average ODA/GDP (%)
Somalia	24.02	Libya	0.07
Liberia	21.70	Tunisia	0.10
Mozambique	19.44	South Africa	0.17
Sao Tomé and Principe	19.40	Algeria	0.25
Guinea-Bissau	18.69	Nigeria	0.73
Cape Verde	16.76	Mauritius	0.94

Source: Own calculations based on OECD DAC Statistics and World Development Indicators.

Table A.4: Precolonial Political Centralization in Africa

Country	Centralization	Country	Centralization
Comoros	1	Angola	0.635
Lesotho	1	Uganda	0.634
Swaziland	1	Togo	0.622
Burundi	0.995	Niger	0.582
Algeria	0.990	Sudan	0.576
Egypt	0.990	Congo Republic	0.536
South Africa	0.990	Madagascar	0.505
Rwanda	0.982	Nigeria	0.478
Tunisia	0.980	Gambia	0.426
Zimbabwe	0.965	Guinea	0.406
Libya	0.940	Chad	0.384
Botswana	0.893	Burkina Faso	0.338
Malawi	0.861	Cameroon	0.316
Mauritania	0.858	Guinea-Bissau	0.214
Mozambique	0.844	Equatorial Guinea	0.211
Ethiopia	0.843	Kenya	0.172
Morocco	0.810	Central African Republic	0.144
Zambia	0.743	Djibouti	0.133
Benin	0.695	Mali	0.115
Senegal	0.694	Cote d'Ivoire	0.082
Tanzania	0.669	Somalia	0.034
Namibia	0.664	Gabon	0.011
Ghana	0.651	Sierra Leone	0.008
Dem. Rep. Congo	0.649	Liberia	0
		AVERAGE (non-weighted)	0.587

Note: The precolonial political centralization index measures the share of the Non-European population that had centralized political institutions before colonization. Data is missing for Cape Verde, Eritrea, Mauritius, Sao Tome and Principe, Seychelles and South Sudan.
Source: Gennaioli and Rainer (2007).

Table A.5: Bivariate Correlation between Precolonial Centralization and Bureaucratic Quality, 1984-2014

Year	Precolonial Centralization Coefficient	Sample Size	Year	Precolonial Centralization Coefficient	Sample Size	Year	Precolonial Centralization Coefficient	Sample Size
1984	0.532	25	**1994**	0.815	37	**2004**	1.321***	37
1985	0.252	34	**1995**	0.795	37	**2005**	1.322***	37
1986	0.278	36	**1996**	0.737	37	**2006**	1.281***	37
1987	0.226	36	**1997**	0.811	37	**2007**	1.301***	37
1988	0.252	36	**1998**	0.948**	37	**2008**	1.319***	37
1989	0.361	36	**1999**	0.889**	37	**2009**	1.332***	37
1990	0.532	36	**2000**	1.121***	37	**2010**	1.262***	37
1991	0.730	37	**2001**	1.142***	37	**2011**	1.262***	37
1992	0.817	37	**2002**	1.194***	37	**2012**	1.262***	37
1993	0.815	37	**2003**	1.220***	37	**2013**	1.275***	37
						2014	1.314***	37

Note: ***denotes significance at the 1% level, ** at the 5% level, *at the 10% level. The coefficient on precolonial centralization is identical for the years 2010, 2011 and 2012 because bureaucratic quality levels remained the same for all countries in the sample during those years.

Table A.6: TseTse Suitability Index in Africa at the National Level

Country	TSI	Country	TSI
Equatorial Guinea	1.475	Namibia	-0.329
Gabon	1.403	Algeria	-0.345
Liberia	1.123	Sudan	-0.352
Congo Republic	1.015	Guinea-Bissau	-0.378
Cameroon	0.986	Burkina Faso	-0.390
Cote d'Ivoire	0.978	Malawi	-0.420
Sierra Leone	0.850	Kenya	-0.430
Central African Republic	0.815	Zambia	-0.434
Mozambique	0.807	Eritrea	-0.482
Benin	0.754	Tanzania	-0.530
Dem. Rep. Congo	0.725	Niger	-0.692
Togo	0.601	Burundi	-0.729
Ghana	0.541	Mauritania	-0.822
Guinea	0.526	Rwanda	-0.875
Somalia	0.489	Zimbabwe	-0.956
Botswana	0.369	Mali	-0.963
Libya	0.329	Senegal	-0.994
Nigeria	0.285	Ethiopia	-1.021
Uganda	0.283	Swaziland	-1.131
Angola	0.278	Morocco	-1.205
Egypt	0.050	Tunisia	-1.265
Chad	-0.244	South Africa	-2.708

Notes: The TseTse Suitability Index has originally been constructed at the regional level for 522 mainland-associated African ethnic groups (Alsan, 2015). African ethnic groups from Cape Verde, Comoros, Djibouti, Gambia, Lesotho, Madagascar, Mauritius, Sao Tomé and Principe and Seychelles were not included in the analysis. In order to construct a TSI index at the national level, we use land area of ethnic groups as weight. Data on land area at the sub-regional level comes from Fenske (2014). We therefore join Alsan's ethnic groups with Fenske's land area data. Unfortunately, land area is not available for each mainland-associated ethnic group. This leaves us with 467 ethnic groups for which we have data on both the TSI and land area. We then sort the 467 mainland-associated ethnic groups according to country. Our data show huge variations in terms of ethnic groups per country. While we have 60 observations for Nigeria (Igbo, Yoruba, Woodabe, Kanuri, among others), we have only two observations for Somalia (Somali, Bajun), and only one observation for Swaziland (Swazi). We then calculate the national TSI for each country.

Appendix B: LIST OF FIGURES

Figure B.1: Relationship between Precolonial Centralization and State Capacity (Other Years)

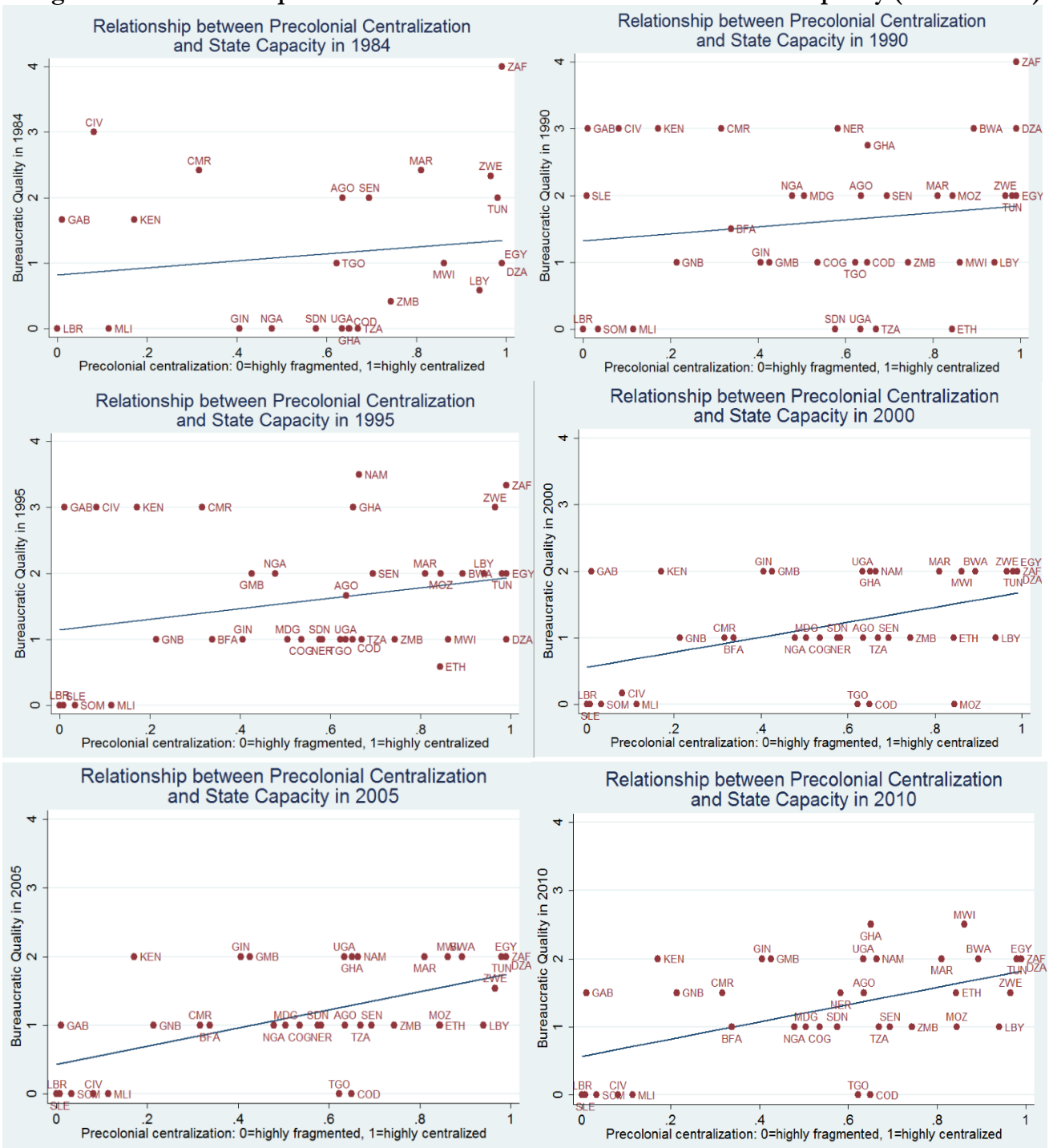
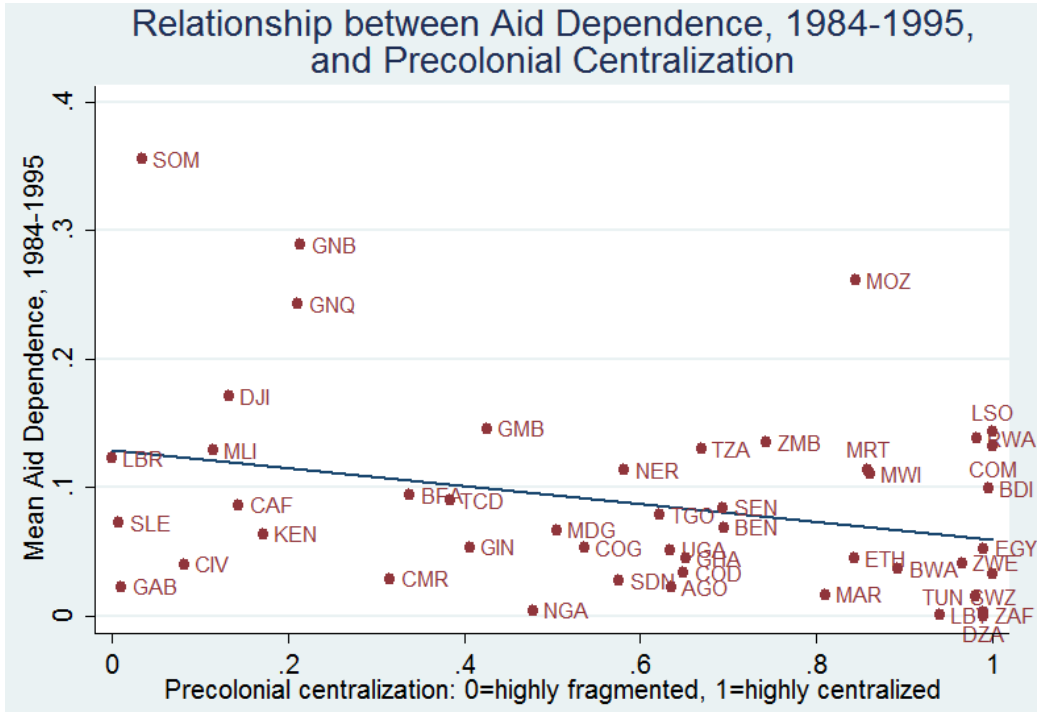
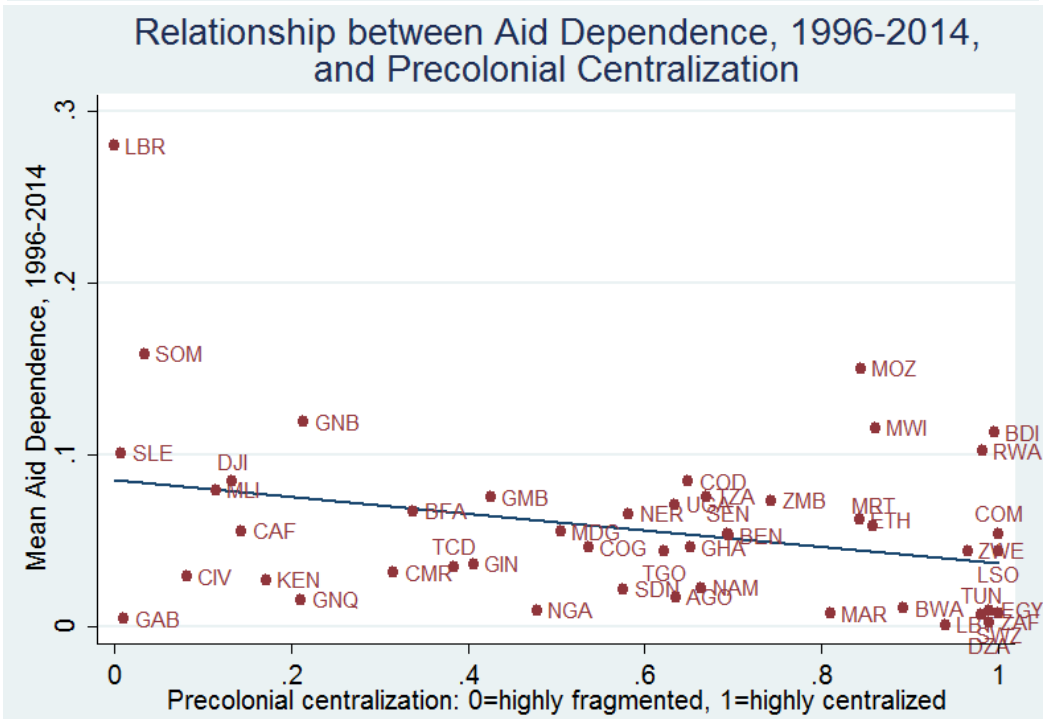


Figure B.2: Relationship between Precolonial Centralization and Aid Dependence (Other Periods)





Appendix C: LIST OF TABLES

Table C.1: Precolonial Centralization and Government Effectiveness in 2014, OLS estimates

Dependent Variable: Government Effectiveness, 2014	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)	OLS (9)	OLS (10)	OLS (11)	OLS (12)
Precolonial Centralization	0.75***	0.75**	0.75**	0.91**	0.50**	0.42	0.74***	0.78**	0.76***	0.66	0.89***	0.79**
	(0.26)	(0.36)	(0.32)	(0.43)	(0.24)	(0.33)	(0.27)	(0.36)	(0.26)	(0.40)	(0.28)	(0.38)
British Colonial Legacy			0.01	-0.09								
			(0.21)	(0.26)								
French Colonial Legacy			-0.05	0.06								
			(0.15)	(0.23)								
Belgian Colonial Legacy			-0.31	-0.30								
			(0.41)	(0.56)								
Portuguese Colonial Legacy			-0.33**	-0.51**								
			(0.15)	(0.24)								
Spanish Colonial Legacy			-0.37***									
			(0.12)									
Mean GDP per Capita, 61-13					0.17	0.18						
					(0.13)	(0.18)						
Mean Aid Dependence, 61-13					-1.23	-1.24						
					(0.97)	(1.02)						
Mean Domestic Violence, 61-13					-0.16***	-0.16***						
					(0.06)	(0.05)						
Mean External Violence, 61-13					1.86*	2.00*						
					(1.07)	(1.02)						
Oil Production Dummy, 61-13					-0.34	-0.33						
					(0.24)	(0.31)						
British Legal Origin							0.24	0.11				
							(0.17)	(0.19)				
Population Density in 1400									0.04	0.09		
									(0.09)	(0.11)		
Artificial State Borders (Partitioned Dimension)											0.19	0.25
											(0.31)	(0.35)
Constant	-1.30***	-0.99**	-1.24***	-1.11**	-1.95**	-1.68	-1.39***	-1.09**	-1.32***	-0.88**	-1.40***	-0.99**
	(0.17)	(0.37)	(0.17)	(0.42)	(0.88)	(1.44)	(0.17)	(0.41)	(0.17)	(0.41)	(0.27)	(0.42)
Observations	48	46	48	46	48	46	48	46	48	46	40	39
Geography Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.18	0.26	0.21	0.31	0.37	0.45	0.22	0.27	0.18	0.27	0.25	0.31
adj. R^2	0.16	0.15	0.10	0.11	0.27	0.27	0.18	0.13	0.15	0.14	0.21	0.15

Notes: The variables *GDP per capita* and *Population Density* are log transformed. Robust Standard errors are shown in parentheses. ***denotes significance at 1% level, ** at the 5% level, *at the 10% level. Geography controls are *Latitude*, *Log Mountainous Terrain*, *% of cultivated land in Köppen–Geiger climate zone A (humid climate with no winter)*, *% of cultivated land in Köppen–Geiger climate zone B (dry climate with no winter)* and *Mean distance to nearest coastline or sea-navigable river (km)*. The colonial dummy for Spain is omitted in column (4) as data on mountainous terrain is not available for Equatorial Guinea.

Table C.2: Precolonial Centralization and Government Effectiveness in 1996, OLS estimates

Dependent Variable:	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Government Effectiveness, 1996	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Precolonial Centralization	0.76**	0.88**	0.87**	1.17***	0.56*	0.76*	0.76**	0.88**	0.74**	0.95**	0.94***	0.92**
	(0.31)	(0.38)	(0.34)	(0.40)	(0.31)	(0.39)	(0.32)	(0.37)	(0.31)	(0.39)	(0.34)	(0.40)
British Colonial Legacy			0.84***	0.64***								
			(0.18)	(0.19)								
French Colonial Legacy			0.77***	0.85***								
			(0.15)	(0.18)								
Belgian Colonial Legacy			-0.36	-0.20								
			(0.21)	(0.36)								
Portuguese Colonial Legacy			0.64***	0.36*								
			(0.21)	(0.20)								
Spanish Colonial Legacy			0.70***									
			(0.09)									
Mean GDP per Capita, 61-96					0.38***	0.21*						
					(0.12)	(0.12)						
Mean Aid Dependence, 61-96					-0.97	-1.15						
					(0.76)	(0.75)						
Mean Domestic Violence, 61-96					-0.05	-0.02						
					(0.04)	(0.05)						
Mean External Violence, 61-96					1.34*	0.45						
					(0.75)	(0.79)						
Oil Production Dummy, 61-96					-0.54*	-0.31						
					(0.28)	(0.28)						
British Legal Origin							0.23	0.01				
							(0.19)	(0.17)				
Population Density in 1400									-0.08	-0.07		
									(0.10)	(0.08)		
Artificial State Borders											-0.19	-0.06
(Partitioned Dimension)											(0.35)	(0.24)
Constant	-1.20***	-0.76	-1.95***	-1.92***	-3.21***	-1.79*	-1.28***	-0.77	-1.16***	-0.84*	-1.13***	-0.61
	(0.19)	(0.46)	(0.15)	(0.37)	(0.79)	(0.95)	(0.20)	(0.49)	(0.19)	(0.45)	(0.29)	(0.54)
Observations	48	46	48	46	48	46	48	46	48	46	40	39
Geography Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.14	0.44	0.37	0.57	0.37	0.54	0.17	0.44	0.17	0.45	0.24	0.46
adj. R^2	0.13	0.33	0.28	0.45	0.28	0.40	0.14	0.34	0.13	0.35	0.20	0.34

Notes: The variables *GDP per capita* and *Population Density* are log transformed. Robust Standard errors are shown in parentheses. ***denotes significance at 1% level, ** at the 5% level, *at the 10% level. Geography controls are *Latitude*, *Log Mountainous Terrain*, *% of cultivated land in Köppen–Geiger climate zone A (humid climate with no winter)*, *% of cultivated land in Köppen–Geiger climate zone B (dry climate with no winter)* and *Mean distance to nearest coastline or sea-navigable river (km)*. The colonial dummy for Spain is omitted in column (4) as data on mountainous terrain is not available for Equatorial Guinea.

Appendix D: DATA AND SOURCES

Dependent Variable

Bureaucratic Quality

The quality of the bureaucracy is a proxy for institutional strength. Bureaucratic Quality tends to minimize revisions of policy when governments change. Therefore, high points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and tends to have an established mechanism for recruitment and training. Countries that lack the cushioning effect of a strong bureaucracy receive low points because a change in government tends to be traumatic in terms of policy formulation and day-to-day administrative functions. Scale is 0-4.
Source: ICRG Index from PRS Group.

Government Effectiveness

Captures perceptions of the quality of public services, the quality of civil service and the degree of its independence from political pressure, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Scale: The composite measure is measured in units of standard normal distribution, with mean zero, standard deviation of one, and running from approximately -2.5 to 2.5, with higher values corresponding to better government effectiveness.
Source: The Worldwide Governance Indicators (WGI) published by the World Bank.

Explanatory Variables

Aid Dependence

Annual total DAC-ODA Net Disbursements in current dollars. Western aid flows include net disbursements from DAC donors only. Gross Domestic Product is expressed in current dollars.
Source: OECD/DAC database (2014) for Western aid flows in current dollars. World Development Indicators from World Bank (2014) for GDP data in current dollars.

Precolonial Centralization

For each country, the index measures the share of the non-European population that belongs to indigenously "centralized" ethnic groups. Scale is 0-1. An ethnic group is defined as "centralized" if it has 2, 3, or 4 jurisdictional levels above the local community according to Murdock's Jurisdictional Hierarchy variable. It is defined as "fragmented" if it has 0 or 1 jurisdictional levels above the local community.

Source: Constructed by Gennaioli and Rainer (2007) using Murdock (1967) and Atlas Narodov Mira (Bruk & Apenchenko, 1964).

Control variables

Historical determinants

Colonial Legacy

Ethiopia and Liberia are the only two countries we classify as independent. We follow the approach taken by Bertocchi and Canova (2002). The former German colonies – Burundi, Cameroon, Rwanda, Tanzania and Togo – were taken over by new colonial rulers after the First World War (WWI). Consequently, we will divide them among the countries that took them over after 1918. Morocco is considered as a former French colony, even though it was a joint protectorate of France and Spain. Moreover, we have classified Somalia as a UK colony, even if there were also (bigger) Italian and (smaller) French portions. Burundi and Rwanda became Belgian colonies, while Tanzania was under British rule after WWI. Cameroon and Togo were subject to a joint French and British mandate. We list Togo under French rule, because the country consists of the French portion only while the British part has been annexed to Ghana. We place Cameroon under France since it is currently a member of the CFA-franc zone.
Source: Bertocchi and Canova (2002).

Slave Exports - (area) or (population)	a) Number of slave exports normalized by size, measured by land area in square kilometers. b) Number of slave exports normalized by size, measured by average population between 1400 and 1900. No slave exports are recorded for Botswana, Cape Verde, Comoros, Lesotho, Mauritius, Morocco, Rwanda, Sao Tomé and Principe, Swaziland, Seychelles and Tunisia. Because the natural logarithm of zero is undefined, the natural logarithm of 0.1 is taken for zero-export countries. Source: Nunn (2008). http://scholar.harvard.edu/nunn/pages/data-0
Years of Independence	Years of a country's independence from colonial rule. The only two African countries that were not colonized are Liberia and Ethiopia. Liberia proclaimed independence in 1847. We use the year 1855 as independence year for Ethiopia. In 1855 Ethiopia was reunified by the Emperor Tewodros II. Many historians view the coronation of Emperor Tewodros II as the beginning of Ethiopia's modern history.
State Antiquity Index	Measures the depth of experience with state-level institutions. The authors began dividing the period 1 to 1950 C.E. into 39 half centuries. Years before 1 C.E. were ignored on the grounds that the experience of more than 2000 years ago would be unlikely to have much effect today, and in order to avoid low-return research effort using low quality information. For each period of fifty years, they asked three questions (and allocated points) as follows: 1.) Is there a government above the tribal level? (1 point if yes, 0 points if no); 2.) Is this government foreign or locally based? (1 point if locally, 0.5 points if foreign [i.e., the country is a colony], 0.75 if in between [a local government with substantial foreign oversight]); 3.) How much of the territory of the modern country was ruled by the government? (1 point if over 50%, 0.75 points if between 25% and 50%, 0.5 points if between 10% and 25%, 0.3 points if less than 10%). Answers were extracted from the historical accounts on each of the countries in the Encyclopedia Britannica. For a given fifty-year period, what is today a country has a score of 50 if it is an autonomous nation, 0 if it had no government above the tribal level, 25 if the entire territory was ruled by another country, and so on. To combine the data of the 39 periods, the authors tried alternative rates for discounting the influence of the past, ranging from 0 to a discount of 50% for each half century. In their analysis, the authors mainly focus on the variable statehist05, which has a discount rate of 5%. For that reason, we are using the same variable. Scale is 0-1. Higher values are associated with more depth of experience with state-level institutions. Source: Bockstette, Chanda and Putterman (2002). http://www.econ.brown.edu/fac/louis_putterman/antiquity%20index.htm
<u>Political determinants</u>	
Years of ancient state history	Logarithm of Discounted Sum of Years of Ancient Statehood, 1 AD to 1950 AD. Source: Putterman (2007).
Vertical legitimacy	Dummy variable that takes on the value of 1 if the post-colonial state is embedded into precolonial relations of authority. Dummy = 1 for Botswana, Burundi, Cape Verde, Ethiopia, Lesotho, Mauritius, Rwanda, Sao Tome and Principe, Seychelles, Swaziland. Source: Englebert (2000).

Artificial State Borders - Partitioned Dimension - Fractal Dimension	Measures the degree to which country borders are natural or artificial. *Partitioned dimension*: Defined as "the percentage of a country's population that belongs to a partitioned group. The latter is a group that is present in two bordering countries." *Fractal dimension*: Captures the straightness or squiggliness of country borders. The fractal dimension variable is log transformed. The rationale behind the construction of the fractal measure is based on the assumption that borders drawn with straight lines increase the chances that those borders were drawn artificially, while squiggly lines are less likely to be artificial. Since the partitioned dimension turns out to be considerably more robust in the analysis by Alesina, Easterly and Matuszeski (2011), we will use the partitioned measure as our proxy for the level of artificial state characteristics in our main analysis. Source: Alesina, Easterly and Matuszeski (2011).
Communist Legacy	Dummy variable that takes on the value of 1 if a country has been under communist rule. The following countries were under communist rule. Angola: 1975-1992; Benin 1975-1990; Congo Republic 1970-1992; Eritrea 1993-today; Ethiopia 1974-1991; Mozambique 1975-1990; Somalia 1976-1991. Source: Constructed by the authors.
Executive Constraints	This variable refers to the extent of institutionalized constraints on the decision making powers of chief executives, whether individuals or collectivities. Such limitations may be imposed by any "accountability groups." In Western democracies these are usually legislatures. Other kinds of accountability groups are the ruling party in a one-party state, councils of nobles or powerful advisors in monarchies, the military in coup-prone polities, and in many states a strong independent judiciary. The concern is therefore with the checks and balances between the various parts of the decision-making process. Scale is 1-7. A high value equates to high constraints on the executive concomitant with effective checks and balances systems. We are using three different variables: i) Constraints on the executive in the first year of independence (i.e. the first year a country enters the data set); ii) Mean constraints on the executive between first year of independence and 2013; iii) Mean constraints on the executive between 1961 and 2013. Source: Jaggers and Gurr (1995); Marshall, Jaggers and Gurr (2014). Center for Systemic Peace. Polity IV Project, Political Regime Characteristics and Transitions, 1800-2013.
Internal Conflict	This is an assessment of political violence in the country and its actual or potential impact on governance. To avoid awkwardness in interpreting the coefficients, we recoded the measure so that a high number reflects a higher degree of internal conflict. The lowest rating is given to those countries where there is no armed or civil opposition to the government and the government does not indulge in arbitrary violence, direct or opposition to the government and the government does not indulge in arbitrary violence, direct or indirect, against its own people. The highest rating is given to a country embroiled in an on-going civil war. Scale is 0-12. Source: ICRG Index from PRS Group.
External Conflict	The external conflict measure is an assessment both of the risk to the incumbent government from foreign action, ranging from non-violent external pressure (diplomatic pressures, withholding of aid, trade restrictions, territorial disputes, sanctions, etc.) to violent external pressure (cross-border conflicts to all-out war). To avoid awkwardness in interpreting the coefficients, we recoded the measure so that a high number reflects a higher degree of external conflict. A low score equates to a very low risk and a high score equates to a very high risk. Scale is 0-12. Source: ICRG Index from PRS Group.

Domestic Violence	Total summed magnitudes of all societal major episodes of political violence (civil/ethnic violence and civil/ethnic war). Scale is 0-10. Source: Marshall (2014). Center for Systemic Peace. Major Episodes of Political Violence, 1946-2013 (War List).
External Violence	Total summed magnitudes of all interstate major episodes of political violence (interstate violence and war). Scale is 0-10. Source: Marshall (2014). Center for Systemic Peace. Major Episodes of Political Violence, 1946-2013 (War List).
Economic determinants	
GDP per capita	Gross Domestic Product per capita in current and constant (2005) dollars. Sources: Maddison (2010). Statistics on World Population, GDP and Per Capita GDP, 1-2008 AD. Groningen Growth and Development Center (GGDC), University of Groningen, The Netherlands: http://www.ggdc.net/maddison/oriindex.htm; World Development Indicators, World Bank.
Gross Public Revenue per capita	Gross public revenue per capita in 1925 and 1929. Measured in 1911 British pounds. Source: Frankema and van Waijenburg (2014).
Legal determinants	
Legal Origin	Identifies the legal origin of the-company law or commercial code of each country. There are originally five possible origins: (1) English Common Law, (2) French Commercial Code, (3) Socialist/Communist Laws, (4) German Commercial Code and (5) Scandinavian Commercial Code. Legal systems in Africa either belong to the English common law or the French civil law family. Dummy variable that takes on the value of 1 for countries with English legal origin, 0 for countries with French legal origin. Source: La Porta et al. (1999).
Cultural determinants	
Ethnolinguistic Fractionalization	Measures the probability that two randomly selected people from a given country will not belong to the same ethnolinguistic group. Scale is 0-1. A higher index is associated with a higher probability and therefore corresponds to higher ethnolinguistic fractionalization. Source: Easterly and Levine (1997).
Polarization Index	Measures the degree to which several ethnic groups are dominant in a country. Levels of ethnic polarization vary with the size of rival ethnic groups. A higher index is associated with a higher polarization (e.g. two rivalling ethnic groups have more or less the same size). A lower index is associated with a lower polarization (e.g. the disparity in size between the majority and minority ethnic group is large). Source: Montalvo and Reynal-Querol (2005).

Ethnic Tensions	This component is an assessment of the degree of tension within a country attributable to racial, nationality, or language divisions. To avoid awkwardness in interpreting the coefficients, we recoded the measure so that a high number reflects a higher degree of ethnic tensions. Higher ratings are given to countries where racial and nationality tensions are high because opposing groups are intolerant or unwilling to compromise. Lower ratings are given to countries where tensions are minimal. Scale is 0-6. Source: ICRG Index from PRS Group.
Religion	Identifies the percentage of the population of each country that belonged to the three most widely spread religions in the world in 1980. The numbers are in % (scale from 0 to 100). The three religions identified are Roman Catholic, Protestant, and Muslim. The residual is called "other religions". Source: La Porta et al. (1999).
<u>Geographical determinants</u>	
Oil Production Dummy	Indicator ranges between 0 and 1. Equal to 1 if country was oil producer in each year in the period studied. Equal to 0 if country has never been an oil producer in each year in the period studied. Intermediate value (between 0 and 1) otherwise. Source: Own calculations based on US Energy Information Administration (EIA) Agency and Ross (2013-02), "Oil and Gas Data, 1932-2011".
Oil production	Average annual oil production per thousand inhabitants from 1970 to 2000. Crude petroleum is measured in thousands of carats. Source: Nunn (2008) using British Geological Survey's World Mineral Statistics and World Mineral Production http://scholar.harvard.edu/nunn/pages/data-0
Gold production	Average annual gold production per thousand inhabitants from 1970 to 2000. Mined gold is measured in kilograms. Source: Nunn (2008) using British Geological Survey's World Mineral Statistics and World Mineral Production http://scholar.harvard.edu/nunn/pages/data-0
Diamond production	Average annual diamond production per thousand inhabitants from 1970 to 2000. Diamonds include both gemstones and industrial diamonds and are measured in thousands of carats. Source: Nunn (2008) using British Geological Survey's World Mineral Statistics and World Mineral Production http://scholar.harvard.edu/nunn/pages/data-0

TseTse Suitability Index (TSI)	The TseTse suitability index (TSI) is a measure for the potential prevalence of the TseTse fly in a region. Using the *potential* rather than the *observed* prevalence as index purges the estimates of bias arising from states with stronger institutions being better able to control the fly. A high index corresponds to a highly TseTse suitable area. A low index corresponds to a less TseTse suitable area within Africa. The index is created using insect physiology and demographic modeling. Source: Alsan (2015).
Latitude	Latitude of country centroid. In those countries where the country centroid fell in the ocean, it was moved to within the nearest land boundary. Source: Gallup, Sachs and Mellinger (1999).
Climate zone A and zone B	% of cultivated land in Köppen-Geiger climate zone A (humid climate with no winter) and zone B (dry climate with no winter). Source: Gallup, Sachs and Mellinger (1999).
Distance	Mean distance to nearest coastline or sea-navigable river (km). Source: Gallup, Sachs and Mellinger (1999).
% Mountainous Terrain	Proportion of the country that is mountainous terrain. Source: Fearon and Laitin (2003).
<u>Demographic determinants</u>	
Population	Total population is based on the de facto definition of population which counts all residents regardless of legal status or citizenship. Refugees not permanently settled in the country of asylum are generally considered to be part of the population of their country of origin. Source: Maddison (2010). Statistics on World Population, GDP and Per Capita GDP, 1-2008 AD. Groningen Growth and Development Center (GGDC), University of Groningen, The Netherlands. http://www.ggdc.net/maddison/oriindex.htm; World Development Indicators, World Bank.
Population Density	Total population in 1400 divided by land area in square kilometers. Total population is based on the de facto definition of population which counts all residents regardless of legal status or citizenship. Refugees not permanently settled in the country of asylum are generally considered to be part of the population of their country of origin. Land area is a country's total area, excluding area under inland water bodies. In most cases the definition of inland water bodies includes major rivers and lakes. Source: McEvedy and Jones (1975).
% of European Descent	Measure of European settlements. % of population that was European or of European descent in 1900. Scale is 0-100. Sources: McEvedy and Jones (1975) and Curtin, Feierman, Thompson and Vansina (1995).

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