

# Complements or Substitutes: State Presence and the Power of Traditional Leaders

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November 2018

## **JOB MARKET PAPER**

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### **Abstract**

When considering the importance of domestic institutions for economic development, the focus has typically been on national institutions (e.g., the nation state). However, within sub-Saharan Africa, traditional leaders (namely, village chiefs) also play an extremely important role. This paper studies how local leaders and the national state interact. Using geocoded data from 5,500 administrative units in 25 countries, I estimate the effect that the presence of the national state has on the power, legitimacy, and effectiveness of village chiefs. I use a regression-discontinuity design to compare villages close to district borders, where one set of villages is far from the district headquarters of the national state and the other set is close. I find that the effect of the nation state on village chiefs hinges critically on whether or not a country's constitution formally integrates village chiefs into the country's institutional structure. In countries in which village chiefs are integrated into national institutions, stronger presence of the state causes village chiefs to be more influential and to provide more public goods. By contrast, in countries in which village chiefs are not institutionalized, more state presence actually causes chiefs to be *less* influential and to provide *fewer* public goods. That is, if village chiefs are not integrated nationally, then national institutions and local institutions actually works as substitutes rather than complements.

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\*Harvard University, Ph.D candidate, henn@g.harvard.edu. I am grateful to Alberto Alesina, Kate Baldwin, Robert Bates, Abhit Bhandari, Emily Breza, Filipe Campante, Raj Chetty, Anne Degraeve, Jeff Frieden, Guy Grossman, Jonathan Homola, Laura Honig, Connor Huff, Torben Iversen, Asim Khwaja, Horacio Larreguy, Gauthier Marchais, John Marshall, Rebecca Martin, Gwyneth McClendon, Nathan Nunn, Pia Raffler, Gautam Rao, Cyrus Samii, Raul Sanchez de la Sierra, Priya Shanmugam, Michelle Torres, and seminar participants at Harvard, APSA, ASA, MPSA, NEWEPS, and WGAPE for helpful comments and suggestions; and Aimable Amani, Simeon Lukeno, Christian Mastaki, and Marakuja Kivu Research for invaluable research assistance. Research funding was provided by the Institute for Quantitative Social Science at Harvard.

# I Introduction

When considering the importance of domestic institutions for economic development the focus has typically been on national institutions (e.g., the nation state). However, within sub-Saharan Africa (henceforth Africa), traditional leaders (namely, village chiefs) also play an extremely important role. Through their association with customary authority, they control resources, most notably land (Goldstein and Udry, 2008), collect informal taxes (Olken and Singhal, 2011), influence voting (de Kadt and Larreguy, 2018), and implement local development projects (Acemoglu, Reed and Robinson, 2014; Baldwin, 2016). The local importance of traditional leaders also concerns the nation state. Traditional leaders could act as local complements or substitutes to national institutions attempting to establish presence. This paper studies how local leaders and the national state interact.

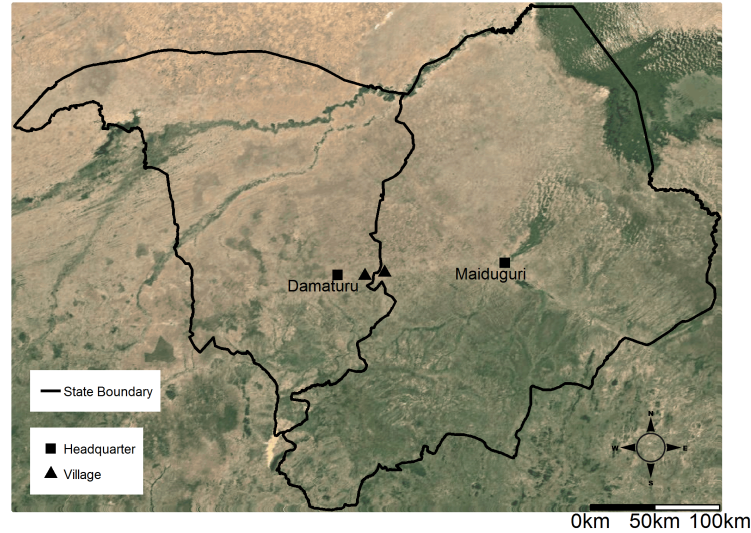
Using geocoded data from 25 countries, I estimate the effect that the presence of the national state has on the power, legitimacy, and effectiveness of village chiefs. Studying the effect of differences in state presence is challenging for at least two reasons. First, measures of state presence are not widely available. Second, differences in state presence are typically correlated with other factors. This paper addresses these concerns with a spatial regression discontinuity design. To begin with, I consider and validate the distance of villages to their district headquarters as a measure for state presence (Webb, 2007; Fergusson, Larreguy and Riaño, 2018).<sup>1</sup> The farther away a village is from the district headquarters, the more difficult it is for local administrators, who are tasked by the national state to administer the district and are more likely to be located at the district headquarters, to provide public services, collect taxes, etc. (Stasavage, 2010; Krishna and Schober, 2014; Brinkerhoff, Wetterberg and Wibbels, 2018). I then use administrative borders within countries to obtain exogenous variation in the presence of the national state. The intuition for this geographic regression discontinuity design (Keele and Titiunik, 2015) can be seen in Figure 1 which shows state boundaries in Nigeria. The two villages (marked by triangles) should be fairly similar in terms of their characteristics, but they are in different states and have different distances to their respective state capitals (marked by squares). Whereas people, goods, and services can move across this internal administrative boundary with relative ease, the state — in the form of state administrators — is unlikely to cross it, thus creating a sharp discontinuity of state presence at the state border.

Using a new data set of 5,500 administrative units in 25 countries and merging it with locations of Afrobarometer and the Demographics and Health Survey respondents, I first

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<sup>1</sup>I use the term *district* interchangeably with other administrative divisions found in various countries such as “commune” or “municipality.”

Figure 1: Illustration of Identification



This figure shows the boundaries of two states (Yobe in the West and Borno in the East) in Nigeria. The state capitals are marked with a square. Two hypothetical villages are shown by triangles.

show that distance to administrative headquarters does indeed reduce outcomes related to state presence. Respondents farther away report paying less taxes, lower public good provision by the state and are less likely to be registered. In addition to the correlational relationship between distance to the state and state presence, I confirm that the spatial regression discontinuity design successfully identifies jumps in state presence. Observations on the side of the border that is closer to the state consistently report higher levels of state presence while geographical and historical controls vary smoothly.

Using the Afrobarometer and DHS data I then find that the effect of the nation state on village chiefs hinges critically on whether or not a country's constitution formally integrates village chiefs into the country's institutional structure. In countries in which village chiefs are integrated into national institutions, stronger presence of the state causes village chiefs to be more influential and to provide more public goods. By contrast, in countries in which village chiefs are not institutionalized, more state presence actually causes chiefs to be *less* influential and to provide *fewer* public goods. That is, if village chiefs are not integrated nationally, then national institutions and local institutions actually works as substitutes rather than complements.

I show robustness to a range of different specifications and measurements. Most notably, I address the endogenous nature of the institutional setup, the validity of the assumptions

underpinning the regression discontinuity design, different choices for the main specification, and the possible endogeneity of administrative borders and headquarters. Specifically, possible determinants of the institutionalization of traditional leaders neither confound these heterogeneous findings nor independently explain the local state-chief relationship. I demonstrate balance on geographical and historical characteristics and that results are not influenced by the exclusion of these controls. I document very low migration among respondents and find no differential migration by state presence. I verify that the results are robust to changing the bandwidth and implementation of bias adjustment from Armstrong and Kolezar (2017). I use alternative measures of distance to the administrative headquarters such as non-log and travel time, and control for the distance to the neighboring headquarter to account for spillovers in state presence. To make sure outliers are not driving the results, I show robustness to dropping the most remote villages, leaving out individual countries, and looking at the first and second administrative divisions separately. I implement a more flexible long-lat specification and more conservative clustering at the highest administrative division. Finally, I deal with endogeneity concerns about the location of the administrative headquarters by instrumenting their location with the most populated place in a given district in 1960, and show no effects of distance to randomly drawn placebo headquarters.

Further survey evidence from the Democratic Republic of the Congo, henceforth DRC — via village surveys collected by the author (Henn, Marchais and Sanchez de la Sierra, 2018) — addresses measurement concerns and confirms substitution effects when the national state is absent and traditional leaders are institutionally separated from the state. The data from the Afrobarometer might be subject to response bias if respondents do not answer questions about their village chiefs and the state truthfully. I provide evidence from Implicit Association Tests, behavioral tests that measure implicit attitudes towards different actors (Lowe et al., 2015), and show that the implicit views of the Congolese state and village chiefs correlate with survey measures. In the DRC, a country where chiefs are not institutionalized, villagers in areas farther away from administrative headquarters claim their village chief is not only more popular, but also more successful in mobilizing and influencing the population. Results from the Implicit Association Tests show that distance to the administrative headquarters leads to lower implicit views of the Congolese state, but higher implicit views of the village chiefs.

Additionally, I collected 20 qualitative interviews with village chiefs in rural villages of two provinces in the Eastern DRC. The villages, which varied in their degree of state presence, offered a more detailed examination of the potential mechanisms in how chiefs substitute for and compete with the state. When the state provided little to no public goods, chiefs regularly took initiative and mobilized the population to make infrastructure investments:

road and bridge maintenance, construction of classrooms, and boreholes. Furthermore, village chiefs were deeply intertwined in the daily lives of the villagers, organizing community meetings, providing local justice, and organizing the support of individuals who had fallen on hard times. In areas where the state was weak, traditional leaders are providing the only source of local governance and are consequently very influential. In areas where the state was active due to economic or security reasons, there was less scope for chiefs to provide for the population, and chiefs report having to compete with the state when mobilizing resources from the population.

My finding that the local influence of traditional leaders is affected by state presence, and that such an effect varies depending on the institutional framework, makes several contributions. First, it extends the recently emerging literature on traditional chiefs (Logan, 2009, 2013; Koter, 2013; Baldwin, 2013, 2014, 2016; Acemoglu, Reed and Robinson, 2014; de Kadt and Larreguy, 2018). The role of the national state in determining chief power has remained poorly understood. Modernization theorists have argued that the modern authority of the nation state will be a substitute for traditional leaders (e.g. Migdal 1988; Mamdani 1996), while recent research points to complementarities between chiefs and national institutions (Baldwin, 2016). This paper reconciles these competing predictions by establishing the institutionalization of traditional leaders as the key moderating factor.

Second, it contributes to the literature on the effect of national institutions on national and subnational development (LaPorta et al., 1999; Acemoglu, Johnson and Robinson, 2001; Campante and Do, 2014; Michalopoulos and Papaioannou, 2014) and specifically the effects of state presence or state capacity (Herbst, 2000; Fukuyama, 2013; Acemoglu, Camilo and Robinson, 2015; Dell, Lane and Querubin, 2018). The paper offers causally identified effects of state presence on local development and how it changes with the institutional context. By highlighting the important interaction between national institutions and local leaders the paper sheds light on the ambiguous effects of national institutions observed in previous studies (e.g. Michalopoulos and Papaioannou 2014).

Third, my empirical strategy of using a spatial regression discontinuity design to causally identify the effect of the presence of the national state closely relates to previous regression discontinuity designs that estimate the effect of national and regional institutions (Miguel, 2004; Dell, 2010; Michalopoulos and Papaioannou, 2014; Gottlieb et al., 2018). It does so by taking insights from research on the effects of physical distance on public good provision (Webb, 2007; Stasavage, 2010; Krishna and Schober, 2014; Brinkerhoff, Wetterberg and Wibbels, 2018) and thereby provides a new data set that allows better measurement and identification of differences in state presence (Hendrix, 2010; Soifer, 2012; Lee and Zhang, 2017; Fergusson, Larreguy and Riaño, 2018).

In the following Section II, I give some background on state presence and traditional leaders in Africa and what empirical implications can be drawn from it. Section III explains the empirical strategy and validates distance as a measure of state presence. Section IV presents the data, and Section V gives the results. Section VI shows robustness. Section VII discusses the implications of the findings for our understanding of the chief-state relationship at the country level, and Section VIII offers concluding remarks.

## II Background and Empirical Implications

### Traditional Leaders

*Traditional leaders* are “rulers who have power by virtue of their association with the customary mode of governing a place-based community” (Baldwin, 2016, 21).<sup>2</sup> Across Africa (and often even within a country), this definition will encompass a variety of traditional leaders who vary in their historical origins and local power. Many traditional leaders are part of lineages that have been in power locally since before colonial occupations. Others were instituted, replaced, or propped up by colonial administrators (Mamdani, 1996). Some had little historical origin and were simply invented (Ranger, 1983).<sup>3</sup> Whatever the case, chiefs in rural Africa have been an important governance institution for a long time, either as the pre-colonial form of governance or as an arm of the colonial government. This legacy of local power has established chiefs as local elites who have important roles and standing in their community.

Conceptually and empirically, I focus on the most local level of traditional leaders, namely village chiefs or headmen. Higher levels of traditional authority, such as paramount chiefs or kings and queens, might exist in a country, but since village chiefs are the ones present and active in the community, they are usually most relevant for local governance and development. Moreover, higher levels of traditional leadership are likely to be able to have influence over the institutional setup whose effect I am interested in. Furthermore, since traditional hierarchies vary substantially across countries, village chiefs offer a more comparable unit across different settings.

Traditional leaders care about their standing in the community and aim to maintain and increase their local power via a mechanism of authority, public goods provision, and legitimacy. Indeed, scholars have documented that chiefs have considerable socio-economic interest in providing governance in their community (Baldwin, Muyengwa and Mvukiyehe,

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<sup>2</sup>For a similar definition, see (Holzinger, Kern and Kromrey, 2016).

<sup>3</sup>Reviews of the literature on traditional leaders can be found in Baldwin and Raffler (2018), Holzinger, Kern and Kromrey (2016), and Nuesiri (2014).

2017; Gottlieb, 2017; Tsai, 2007).<sup>4</sup> Through their association with customs and traditions, they are endowed with local authority over the population (Zartman, 2000). They control resources, most importantly land (Goldstein and Udry, 2008; Boone, 2014; Honig, 2017), and their standing allows them to impose social sanctions (Sheely, 2018). Whilst they might use their authority for their own benefit (Clayton, Noveck and Levi, 2015), this authority also enables them to provide services and public goods to the community. Land allocation and justice provision are clear examples of how authority is used in such a way. Additionally, chiefs can convince the population to contribute labor to public construction works such as schools or boreholes (Baldwin, 2016; Voors et al., 2017).<sup>5</sup> Furthermore, with their superior local information, chiefs might help to best allocate goods and services to the population (Díaz-Cayeros, Magaloni and Ruiz-Euler, 2014).<sup>6</sup>

The provision of such services and public goods in turn contributes to the legitimacy of the particular chief and customary governance in general. Citizens often cite past contributions by their chief or past chiefs as reasons for their support for the institution (Logan, 2013). Legitimate chiefs are bestowed with more authority: both directly, by increasingly deferring to traditional leaders in resource allocation and social questions, as well as indirectly, by refraining from seeking and promoting other actors with competing authority (Ayittey, 1991). In this cycle of chief power historical provision leads to legitimacy, which provides authority that can be used to provide in the future.

Local influence of traditional leaders varies across (and within) countries and over time. This paper investigates a potential mechanism that could explain such variation, the presence of the state and the institutional arrangement of traditional leaders.

## State Presence in Africa

African nation states have struggled to establish universal presence across their territory and population. Several factors have led to an under-provision of the state in rural Africa. First, limited resources, geographic constraints, and low population density makes coordination with the local state costly (Scott, 1998; Herbst, 2000). Second, different areas vary in their political significance for the central state which decreases the incentives to invest locally (Bates, 1983) and for the media and citizens to monitor its performance (Campante and Do,

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<sup>4</sup>They might care about their status for selfish reasons since they can extract rents from it. Alternatively, they could be benevolent and may want to increase their local power to provide more for the population. This paper does not take a stance on this question.

<sup>5</sup>Examples of public goods provided by traditional leaders can be found in Figure A1, which shows pictures from villages in the DRC.

<sup>6</sup>Incidentally, scholars find that chiefs who are competitively chosen — and have lower local authority — are less successful in mobilizing the population (Acemoglu, Reed and Robinson, 2014; Baldwin and Mvukiyehe, 2015).

2014). Third, the relationship between the central state and its local bureaucrats suffers from principal agent problems which are exacerbated by low education levels and resource constraints (Epstein and Sharyn, 1994; Evans, 1995). Local variation in bureaucratic composition and technology leads to the central state being more effective in monitoring and incentivizing some local bureaucrats versus others.<sup>7</sup> Section III discusses how the empirical strategy of using physical distance to administrative headquarters as a measure of state presence is designed to pick up this variation and estimate its causal effect.

The inability of national institutions to reach the whole population and territory stands in contrast to the widespread existence of often powerful local traditional leaders. It opens the door for the nation state to compete or cooperate with these local leaders.

## Variation in State-Chief Relationship

States in Africa have chosen a wide array of strategies when dealing with traditional leaders that primarily vary on one key dimension: institutionalization.

Institutionalization occurs when governments give traditional leaders a formalized role in local governance. Such institutional linkages can broadly be put into three non-exclusive categories: development brokers, electoral brokers, and administrative brokers. In the developmental broker setting, chiefs act as an intermediary between politicians and the local population. They use their superior information of local needs to advocate for the provision of public goods. Once development projects are allocated, the chiefs' ability to mobilize resources is put into action (Baldwin, 2016). In the electoral broker setting, chiefs use their local authority to convince voters to vote for a given party in return for private or public benefits (de Kadt and Larreguy, 2018). In the administrative setting, traditional leaders take over low-level administrative functions typically associated with the state, such as justice provision, land allocation, and titling (Miles, 1993). Furthermore, state building can be boosted by using the legitimacy of traditional leaders (Englebert, 2002).

When the central state does not institutionalize traditional leaders, their relationship is fundamentally different. Traditional leaders remain local elites and are active in their community (Sklar, 1999). They care about their local status and thus continue to exert control and provide some public goods. Their local authority is independent of the state and often in direct competition to it, since they represent an alternative governance institution with their own source of legitimacy stemming from their link to customary authority. Traditional leaders also cannot rely on the state for resources and lack formal channels to

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<sup>7</sup>In light of these challenges, some countries undergo political decentralization. While this decreases some aspects of variation in state presence, others persist and are potentially exacerbated. The way decentralization might affect measurement and identification will be discussed in Section III.



interact with the local state. Local chiefs and state officials or politicians might still be able to find mutual agreeable ways to cooperate on public good provision or elections. Yet, the lack of institutionalization makes cooperation less likely by precluding a formal relationship and increases competition through rival claims of local authority. In some areas such as land, justice provision, or taxation, traditional leaders might directly compete with the state and offer alternative solutions (Herbst, 2000; Olken and Singhal, 2011; Sandefur and Siddiqi, 2013). In other settings, they offer a more indirect local alternative that engages with the population and sometimes leads to the support of opposition parties (Vaughan, 2006) or even local armed struggles (Hoffmann, Vlassenroot and Marchais, 2016).

Given these two options, the central state has an incentive to institutionalize traditional leaders in order to benefit from their superior local technology (information and societal control) and to be associated with their customary authority. On the other hand, institutional inclusion of chiefs makes them part of developmental, electoral, or administrative processes and allows them to capture rents. We would thus expect the central state to institutionalize chiefs when they possess sufficient local authority and have higher local capacity than the local state (making them more effective at implementing policies, delivering votes, and so on) but are not too powerful (allowing them to capture more rents).<sup>8</sup>

A key challenge for the empirical analysis of institutionalization is that it is hard to measure and likely endogenous. To overcome this challenge, this paper focuses on the national level variation of institutionalizing chiefs via a country's constitution. While some *de facto* variation in local institutional linkage might exist, national-level decisions create meaningful structures for cooperation and send important signals. Importantly, local-level variation is unlikely to influence national-level decision making. Instead, the constitutional choice was based on the national-level situation at the time of the constitutional writing. Constitutionally, the decision to incorporate chiefs can only be made at the national or regional level. For example, whether or not chiefs are legally recognized as local governance actors, sit on development boards, or can allocate land titles has to be decided uniformly for the whole country or province. Additionally, such national-level policies are typically the result of a one-time decision-making process during the writing of the constitution, typically after independence or regime change. Thus, the resulting variation is not confounded by recent changes in state or chief power.

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<sup>8</sup>Previous research has also identified democracy, colonial background, economic resources, state capacity, and decentralization as factors determining this decision. Section VI presents suggesting evidence that these possible determinants of the institutionalization of traditional leaders neither confound these heterogeneous findings nor independently explain the local state-chief relationship.

## Empirical Implications

The nation state's different modes of dealing with traditional leaders is likely to have empirical implications for how national institutions and local leaders interact. Specifically, institutionalization of chiefs will shape how differences in state presence affect the power, legitimacy, and effectiveness of chiefs.

When the state and chiefs are institutionally separated, they are likely to compete locally for resources and authority. State presence in this setting does not affect the chiefs' resources directly, since there is no formal link between chiefs and the state. However, higher state presence leads to more demands on the population for taxation and labor and thus crowds out the chiefs' ability to mobilize resources locally. For example, traditional leaders in the DRC in villages with more state presence report difficulties raising taxes locally due to the demands by the state.<sup>9</sup> Additionally, the state and chiefs compete for local authority. In the case of high state presence, the nation state will be providing more local public goods, and chiefs will lose power. However, when the state is absent, the population's demand for governance by traditional leaders increases as the state is unable to provide it (Logan, 2013). Chiefs will be more influential and gain status in comparison to a state that is not delivering. In qualitative interviews in the DRC, villagers typically expressed gratitude to the chief as the only actor that is providing anything in the village.<sup>10</sup> Thus, *when the nation state and chiefs are institutionally separated, chief power should be negatively correlated with state presence*. They are substitutes.

When the state and chiefs are institutionally linked, their resources and legitimacy become intertwined, and the effect of state presence on chief power is likely to be different. Chiefs receive funds or materials from the state to implement local projects. In South Africa, traditional rulers acting as electoral brokers rely on the funds provided by the government (Williams, 2010). Similarly, in Zambia, chiefs coproduce local public goods as development brokers (Baldwin, 2016) but are dependent on the state to also contribute resources. Just as traditional leaders became more responsive to the state than to the population during colonial rule (Mamdani, 1996), formalization of chiefs makes the state a principal of the chiefs, thus weakening their responsiveness to the population (Carlson and Seim, 2017). Institutionalization of traditional leaders thereby also links their legitimacy to the state and vice versa (Englebert, 2002). In many instances, chiefs are considered part of the state apparatus, and they try to use their formal role to increase local authority (Lund, 2003). Due to this linkage, cooperation with the state makes the proper attribution of credit for accomplishments (or

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<sup>9</sup>e.g. Qualitative Interview P2, July 2017, South Kivu Province, DRC and L18, July 2018, North Kivu province, DRC.

<sup>10</sup>e.g. Qualitative Interview P4 and P6, July 2017, South Kivu Province, DRC.

blame for failures) more difficult. Accordingly, in a sample of countries where chiefs are institutionalized, Logan (2009) finds that trust in traditional leaders is positively correlated with perceptions of the performance of the local government. In this context, in villages with higher state presence, chiefs benefit from more resources and positive association with a successful state that increases their status. Inversely, chiefs in villages where the state is absent will suffer from a lack of resources and are blamed for state failures. Consequently, *when the nation state and chiefs are institutionally linked, chief power should be correlated with state presence.* They are complements.

When the chiefs are institutionalized and the state is absent, traditional leaders might still attempt to substitute for the weak state as they would when they are institutionally separated. In that case, they may gain influence as the only actor providing locally. Institutionalization reduces their ability to substitute when the state is absent, even if they might attempt to do so, by reducing their available resources and legitimacy.

The institutional strategy is also likely to impact public good provision. Institutionalizing chiefs has the potential to improve public good provision, as chiefs are more efficient locally. They are able to mobilize the population to contribute labor, land, or funds to development projects; they may also have information about the needs of the population and possess local management skills (Díaz-Cayeros, Magaloni and Ruiz-Euler, 2014; Baldwin, 2016; Voors et al., 2017). On the other hand, chiefs might appropriate some of the rents, thereby reducing public good provision. Which of the two dominates will depend on the social embeddedness of the traditional leaders and their accountability to the local population (Tsai, 2007; Acemoglu, Reed and Robinson, 2014; Gottlieb, 2017). While the effect of institutionalization of chiefs on average public good provision is ambiguous, its impact on the relationship between state presence and public good provision is more straightforward. Since lower state presence will also reduce the local influence of traditional leaders when they are institutionalized, their ability to provide public goods will diminish. With less resources and lower legitimacy when the state is absent, chiefs will have a harder time mobilizing the population and exerting local authority. In countries where traditional leaders are not linked with the state, they are more likely to be effective in stepping in and compensating for a weak nation state. Therefore, *states where the chiefs are included in the constitution should have a stronger relationship between state presence and public good provision.*

Note that chiefs are only able to step in and provide certain public goods. Without the support of the state, chiefs rely on the local population to mobilize resources. The local population can typically only support public goods of a limited scope and technology. As a result, chiefs should only be able to provide public goods that are local (e.g. basic maintenance, constructions, local justice provision), but not ones that are regional or specialized

(e.g. providing health care).

### III Empirical Strategy

Studying state presence comes with two central challenges: measurement and causality. My empirical strategy overcomes these challenges by using distance to administrative headquarters as a measure of the presence of the national state and by comparing villages across internal administrative boundaries to obtain exogenous variation in state presence.

#### Measuring State Presence

To compare the effect of within country variation in state presence, this study requires a measure that (i) is available (and comparable) for multiple countries in Africa; and (ii) varies at a subnational level. The measures proposed in the literature are problematic in terms of both requirements, especially due to the lack of high-quality subnational data.

Instead, I measure state presence based on the idea that it varies with the physical distance to state institutions (Fergusson, Larreguy and Riaño, 2018). State agents' ability to govern and implement policies in a given location decreases the farther away they are. Similar points have been made in the literature on the loss of strength gradient (Boulding, 1962; Webb, 2007). It is also consistent with the theoretical observation that remoteness makes administration costly (Stasavage, 2010) and recent studies that show the importance of geographical distance for service delivery (Brinkerhoff, Wetterberg and Wibbels, 2018). Consider a police station, for example. Two main responsibilities of any police department are patrolling and responding to emergencies. Both tasks will be easier to perform closer to the police station. Police will take a longer time responding to emergencies farther away, thus reducing efficiency. Patrolling areas more distant from the police station both takes more time and simultaneously leads to exposure to closer areas on the way to the locations farther away.<sup>11</sup> This paper posits that this relationship between distance and presence is at work for most state agents, such as the tax collector, or officials tasked with overseeing infrastructure and service delivery. It works via at least three mechanisms: First, the cost of implementing policies and administrating increases farther away from the local state headquarters; second, overseeing the work of state agents becomes more difficult; and third, areas farther away from the local headquarters are typically less populated and have lower economic activity, which decreases the state's interest to project power.

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<sup>11</sup>Incidentally, researchers and policymakers have long realized the importance of distance to effective policing and many departments now design police command and patrol areas with the goal of minimizing distance (see e.g. Curtin, Karen and Qiu (2010)).

The relationship between distance and state presence is especially relevant in the African context, where governments are heavily resource constrained and historically struggle to project and exercise power across their territory (Bates, 1983; Mamdani, 1996; Herbst, 2000). Scholars have demonstrated that the physical distance to the national capital affects conflict, development, and the diffusion of national institutions (Michalopoulos and Papaioannou, 2014; Campante, Do and Guimares, 2017). However, simply using the distance to the national capital as a measure of state presence would limit this study and leave out important variation. The national capital is not the only location of state institutions. Aware of the difficulty of governing from afar, central states outsource many functions to lower-level administrative divisions such as provinces or districts. The local governments of these units are located at the administrative headquarters, which also house local branches of state institutions such as the police, postal service, or ministries. The administrative headquarters are thus an important seat of state presence. As discussed above, administrators stationed at the local headquarters will have a harder time administrating (collecting taxes, providing public goods, etc.) locations farther away, creating variation in state presence. Consequently, this study uses the distance of African villages to the headquarters of their administrative units as a measure of state presence.

In order to validate this measure of state presence, Panel A in Table 1 shows the OLS results of regressing log distance to the appropriate administrative headquarters on measures from the Afrobarometer survey that are suggestive of state presence and have previously been used in the literature: tax payment, local development infrastructure, and usually state-provided public good provision. I have chosen measures that are typically provided by the state and not other actors such as NGOs or traditional rulers. The three measures are combined to create a state presence index. All three measures, as well as the index, indicate that state presence and distance to the administrative headquarters are negatively correlated (to the extent that the state is less capable of obtaining taxes from its citizens, or providing local development and public goods). Panel B in Table 1 shows the same strong correlation between distance to administrative headquarters and state presence outcomes in data obtained from the Demographic and Health Surveys. Again, I have chosen outcomes that are typically provided by the state: whether children have birth certificates and vaccination cards, whether the family has electricity, and whether the household has piped water. To illustrate the relationship, Figure 2 shows a bin-scatter of distance to the administrative headquarters and the state presence index, as well as their linear and polynomial relation. There seems to be a consistent negative relationship between state presence outcomes and distance to the administrative headquarters across both the Afrobarometer and DHS data.

Still, like all measures of state presence, using distance suffers several problems. Distance

to administrative headquarters constitutes a compound treatment, as several other factors vary farther away from the state. State presence is correlated with many other variables, such as urbanization or economic activity. Furthermore, village locations and their distance to the headquarters are not random. Citizens living at the fringes of the state are different or have chosen to live there (Scott, 2009). I use the following strategy to address these endogeneity concerns.

Table 1: Effect of Log Distance to HQ on Outcomes Related to State Presence

<b>Panel A: Afrobarometer Data</b>	<i>Dependent variable:</i>			
	Taxes paid (1)	Local Dev (2)	Public Goods (3)	State Presence Index (4)
Log Distance to HQ	-0.153*** (0.030)	-0.206*** (0.015)	-0.094*** (0.016)	-0.150*** (0.013)
Observations	3,346	15,524	15,544	15,544
Adjusted R <sup>2</sup>	0.221	0.605	0.333	0.481

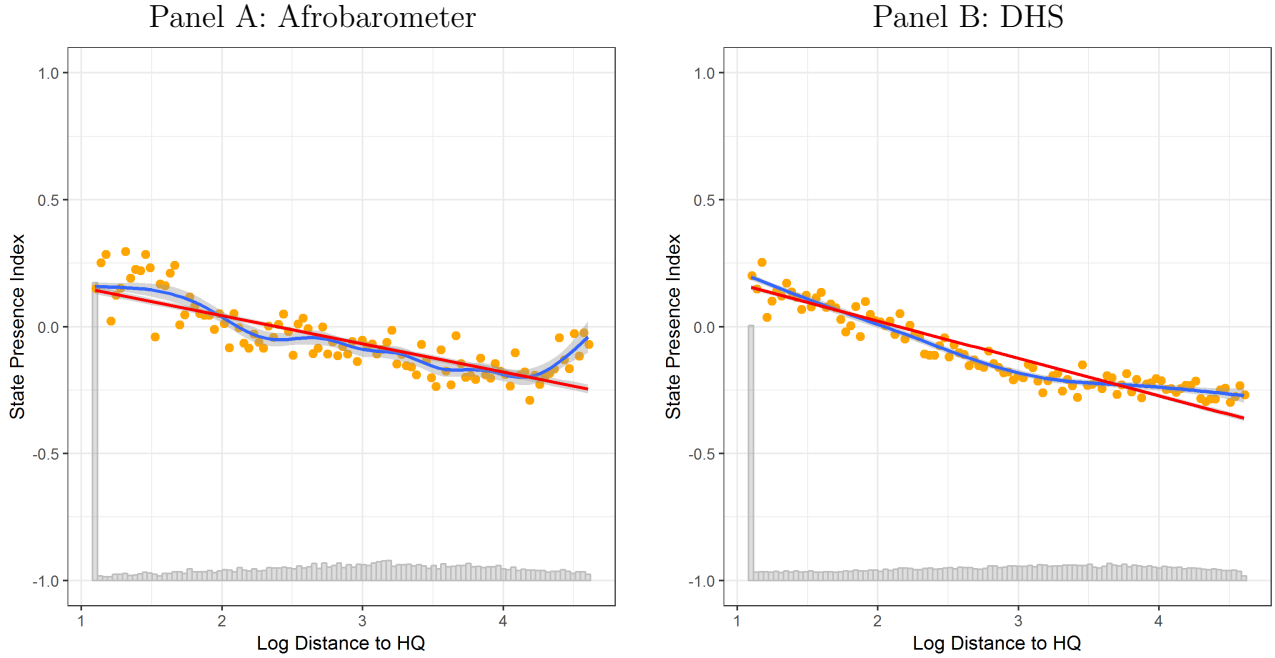
<b>Panel B: DHS Data</b>	<i>Dependent variable:</i>			
	Registered (1)	Electricity (2)	Piped Water (3)	State Presence Index (4)
Log Distance to HQ	-0.128*** (0.009)	-0.311*** (0.012)	-0.261*** (0.014)	-0.216*** (0.008)
Observations	28,814	30,239	30,239	30,239
Adjusted R <sup>2</sup>	0.758	0.559	0.463	0.624

Clustered standard errors in parentheses

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Notes: This table shows the results of OLS regressions with log distance to the administrative headquarters as the independent variable and various outcomes of state presence as the dependent variables. The countries in the sample can be seen in Figure 4. Standard errors are clustered at the district level. Geographic and historical controls are included as well as district level and survey round fixed effects. Panel A uses data from the Afrobarometer survey. The following standardized dependent variables are used: Column (1): A z-score of whether the respondent reported to have paid various taxes (only asked in round 4 of the Afrobarometer). Column (2): A z-score of local development infrastructure: running water, sewage, and electricity. Column (3): A z-score of local public good provision: hospitals, schools, post office, markets, and police stations. Column (4): An index of state presence created by combining columns 1-3. Panel B uses data from the DHS survey. The following dependent variables are used: Column (1): A z-score of the average percentage of household members registered with the state and whether children have vaccination cards (not asked in every DHS round). Column (2): Percentage of households with electricity. Column (3): Whether the household has piped water. Column (4): An index of state presence created by combining columns 1-3.

Figure 2: Bin-scatter between state presence and distance



*Notes:* This figure shows a bin-scatter (orange) of distance to the headquarters and the state presence index as well as their linear (red) and polynomial relation (blue). A histogram of the distance measure is shown at the bottom. Panel A shows the Afrobarometer data and Panel B shows the DHS data. Figure A2 in the Appendix offers alternative ways to represent the data.

## Using Administrative Borders as Identification

I identify the effect of variation in state presence using a spatial regression discontinuity design (RDD) around internal administrative borders (Holmes, 1998; Dell, 2010; Keele and Titiunik, 2015, 2016). A spatial RDD measures the local treatment effect at a geographic boundary that splits observations into treated and control areas. It assumes that the division around the boundary is as-if random. Implementing a spatial RDD requires restricting the sample to observations close to the boundary, defining the treatment at boundary, and measuring a running variable that indicates each observation's distance to the boundary.

The central idea of the identification strategy is to compare villages on both sides of administrative boundaries within a country. While people, goods, and services move freely across these administrative borders, government officials, tasked with administering specific districts usually do not. Specifically, using distance to the administrative headquarters as a measure of state presence, we observe a discrete change in the distance to the state on each side of an administrative border since the relevant administrative headquarter changes. At the same time, the distance to relevant non-state locations does not change at the border. People can (and do) cross the internal border to go to the market, find employment, or travel. In fact, most of these internal boundaries are barely noticeable on the ground. Therefore,

administrative boundaries will create a discontinuity in state presence, while other observable and unobservable confounder should vary smoothly across the border.<sup>12</sup>

First, I restrict the sample to villages close to the internal administrative border (within 5 kilometers for the main specification) *within* a country. Villages are then assigned to “border regions”, i.e. an area on both sides of an internal administrative boundary. A village is assigned to the border region ‘XY’ if it is in district ‘X’ and within 5km of its closest neighboring district ‘Y’ or if it is in district ‘Y’ and within 5km of district ‘X’. By including border region fixed effect, I only compare villages at the same internal border.<sup>13</sup> In Section VI, I show that the exact choice of bandwidth does not drive the results by replicating the findings using bandwidths ranging from 3km to 20km.

Second, I create a low state presence treatment variable by assigning villages as being treated if they are on the side of a border region farther from their respective administrative headquarter than the villages on the other side of the border are from their headquarters. I create a binary treatment variable by calculating the mean distance to their administrative headquarter of villages on each side of the border region and then comparing the two sides. The treatment variable indicates for each village whether the mean distance on its side of the border region is larger than on the other side.

*Treatment: (Mean Distance in Own District Border Region - Mean Distance in Neighboring District Border Region) > 0*

Such a binary treatment variable, however, disregards potentially important variation. It treats border regions where the distance to the state is only slightly different on each side the same way as border regions with a big change in distance from one side to the other. Therefore, I also create an intensive treatment measure that measures by how much the log-distance to the administrative headquarter is bigger on one side than on the other.<sup>14</sup> In Section VI I show robustness to using only the binary treatment variable.

In this design, distance to administrative headquarters jumps discontinuously at the administrative border. Yet, not every village in a border region will be situated directly at the boundary. Therefore, in order to identify the jump in state presence at the border I implement a local linear regression discontinuity design. To do so, I control for a village’s

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<sup>12</sup>Note that not all local state services will fully respect every internal boundary. Some jurisdictions are based on higher or lower level administrative boundaries. For other public services (hospitals, for example) people can cross internal boundaries to use them. In this paper, I will abstract from these differences and posit that for a given administrative boundary, there will always be a considerable number of local state agents and services that are bound by the border and thus create a jump in local state capacity. While I will address spillovers more directly in the robustness section, in general this local state capacity spillover across the boundary should downward bias my results.

<sup>13</sup>Also note that these fixed effects will control for all country level variation.

<sup>14</sup>Using the logged distance takes into account the relative change across the two sides. I also show robustness using the non-logged distance.



distance to the border as well as the interaction of that distance with the treatment variable.

## Main specification

The identification strategy leads to the following main specification:

$$Y_{v,s,r} = \beta_0 + \beta_1 Tint_s + \beta_2 DB_v + \beta_3 T_s \times DB_v + \beta_4 \chi_v + \beta_5 BR_r + \epsilon_{v,s,r} \quad (1)$$

where the dependent variable  $Y_{v,s,r}$  is the outcome of interest in village  $v$  situated on side  $s$  of the border region  $r$ ;  $Tint_s$  is the treatment intensity indicating by how much distance to administrative headquarters drops on side  $s$  of border region  $r$ ; to account for a village’s location relative to the boundary  $DB_v$  is the distance of village  $v$  to the administrative border;<sup>15</sup> the distance to the border is interacted with a binary treatment variable  $T_s$  (whether the average distance on the village’s side  $s$  of the border region  $r$  is larger than on the other side) to complete the regression discontinuity design;  $\chi_v$  is a vector of geographical and historical controls for village  $v$  which are pre-treatment;<sup>16</sup> and  $BR_r$  are the border region fixed effects that will also eliminate cross-country variation. Standard errors are clustered at the district level. The coefficient of interest here is  $\beta_1$ . It signifies the jump at the border, after  $\beta_2$  and  $\beta_3$  control for the linear trends on both sides.

Distance to an administrative headquarter is likely to have a different impact on state presence depending on the country and administrative division. Some countries assign different responsibilities and resources to the province or district level, resulting in a different distance-state presence relationship. Figure 3 illustrates these differences by showing the different coefficients of distance on the index of state presence-related outcomes by country and administrative division. In some countries, distance matters more for state presence outcomes than in other countries, and even within countries there are differences between administrative divisions. As a result, the treatment at the boundary will differ across cases. I account for such heterogeneity in the main specification by scaling the intensive treatment measure by the inverse of these coefficients. In other words, state presence at an administrative border changes based on how much farther the administrative headquarter is on one side than on the other side multiplied by how much distance matters in the given country and administrative division.<sup>17</sup>

This spatial discontinuity design relies on two key assumptions: other covariates vary smoothly at the boundary and no selective sorting of individuals around the boundary.

<sup>15</sup>Note that it is inversed when treatment is 0.

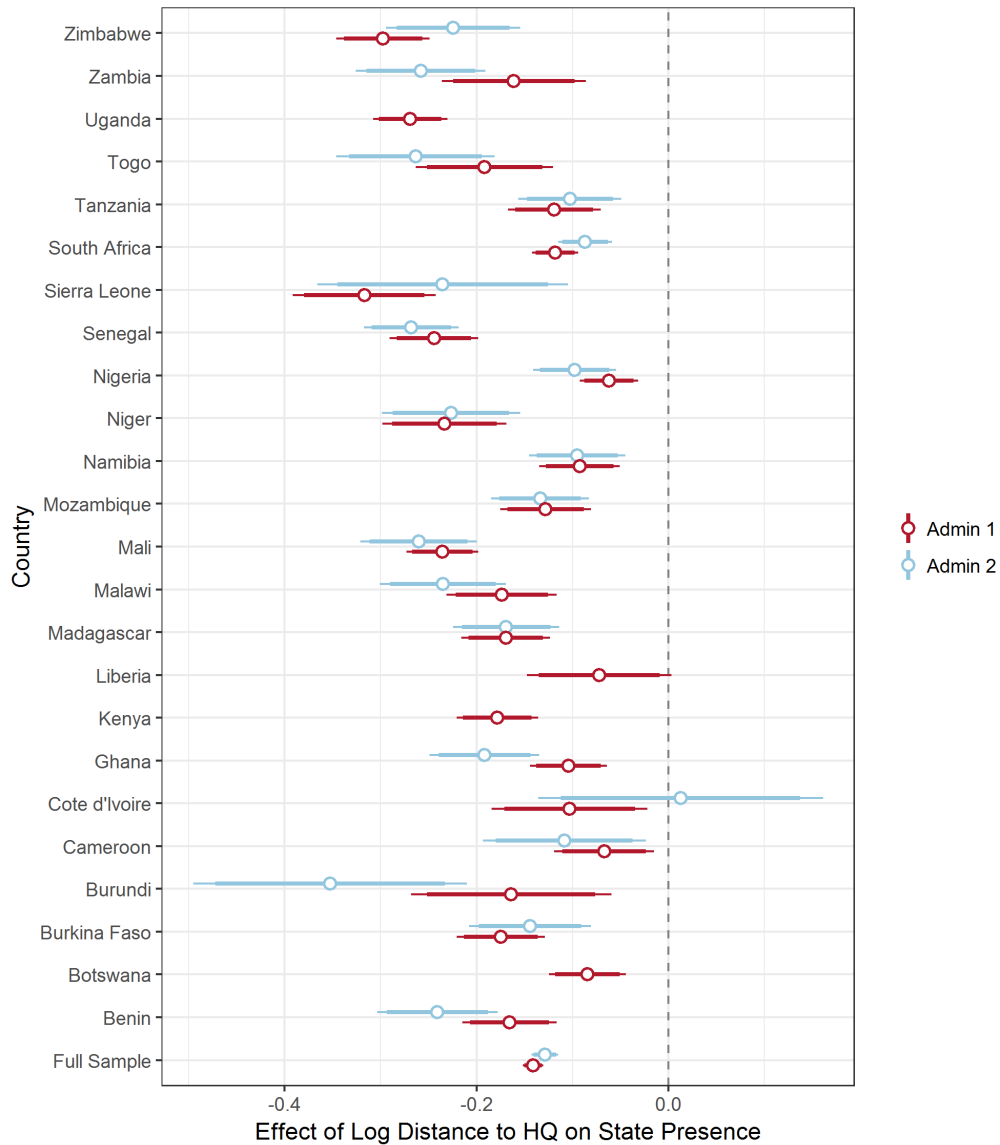
<sup>16</sup>I also show robustness to leaving out these control variables.

<sup>17</sup>Since this country and administrative unit specific gradient of state presence might be endogenous to country-level decisions, I run the specification without scaling of the treatment in Section VI.

Looking at internal administrative boundaries provides a good setup for this design. Other factors — for example, market access — are not influenced by these borders and thus should vary smoothly. Similar assumptions have been made in previous studies (Dube, Lester and Reich, 2010; Naidu, 2012; Gottlieb et al., 2018; Fergusson, Larreguy and Riaño, 2018). I show robustness in Section VI, which addresses several concerns regarding the empirical strategy, most notably the validity of the assumptions underpinning the regression discontinuity design, different choices for the main specification, and the possible endogeneity of administrative borders and headquarters.

I then introduce institutional variation in two alternative ways. First, I interact the treatment variable, the distance to the border and their interaction with an indicator of the institutional setting. The coefficient of interest is the one on the interaction between institutionalization and the treatment indicator. Second, I subset the data and run the analysis separately for the sample where traditional leaders are institutionalized and where they are not.

Figure 3: Correlation between state presence and distance by country and administrative division



This figure shows the coefficient of the log distance to administrative headquarter when regressing it on the constructed state presence variable. The specification is the same as in Table 1, but without fixed effects and clustering, and is run separately by country and administrative division. There is only one administrative division in my data set for Botswana, Kenya, Liberia, Malawi, and Uganda.

## IV Data

This study uses geo-coded data from the Afrobarometer and Demographic and Health Surveys, an original data set of administrative headquarters and borders, as well as behavioral measures and qualitative interviews from the DRC.

### Afrobarometer

To investigate the impact of variation in state presence, I use the third, fourth, fifth, and sixth rounds of Afrobarometer (Afrobarometer, 2017). Rounds 3, 4, 5, and 6 were conducted in 18, 20, 34, and 36 African countries, respectively, on a random and nationally representative sample of voting-age individuals (either 1,200 or 2,400 per country). Round 3 was conducted in 2005, round 4 between 2008 and 2009, round 5 between 2011 and 2013, and round 6 between 2014 and 2015. For each respondent, Afrobarometer data contains the town or village of residence, which have been geo-coded by AidData (BenYishay et al., 2017). An alternative source of the locations was obtained from Nunn and Wantchekon (2011) (round 3), Knutsen et al. (2017) (rounds 4 and 5), and hand-coding (missing coordinates and round 6).<sup>18</sup>

### Demographic and Health Surveys

Additionally, I use geo-coded responses to the Demographic and Health Surveys (DHS) conducted by the United States Agency for International Development (USAID) in 17 countries in Africa. The DHS data contains demographic information on households and data on the provision and utilization of health services. I use all geo-coded data available for the time period (2002-2015) and countries surveyed by the Afrobarometer plus the DRC.<sup>19</sup>

### Administrative Headquarters and Boundaries

Next, I constructed a data set with the administrative units and their headquarters for 24 of the countries that were surveyed in any of the four rounds of the Afrobarometer plus the DRC.<sup>20</sup> The sample is visualized in Panel A of Figure 4. First, I identified which

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<sup>18</sup>I further restrict my sample to the respondents geo-coded at the town/village level, as opposed to the ‘district’ level.

<sup>19</sup>Note that the exact location of respondents is slightly scrambled in the DHS data (up to 5km in most cases and up to 10km in rare cases). While this will likely increase noise in the estimates, it is unlikely to bias the results in a systematic way.

<sup>20</sup>I omitted North African countries, small countries (Lesotho, Swaziland), island nations (Cape Verde, Mauritius, Sao Tome), and countries where shapefiles or headquarters were unavailable.

administrative divisions are responsible for public good provision in each country in the sample. I then selected the two most relevant administrative divisions and created a list of all units, their headquarters, size, and population at the last census using multiple sources (official documents, OpenStreetMap, GoogleMaps, Statoids.com, Wikipedia). This produces over 5,500 headquarters in 46 administrative divisions. I then geo-coded the location of all headquarters using GoogleMaps, GeoNames.org, OpenstreetMap, and Wikipedia. I use satellite imagery from GoogleMaps to verify that the coordinates did indeed fall on a larger population center. In order to determine which administrative unit a given village belongs to, I obtained shapefiles of all 46 administrative divisions in the 25 countries using GADM.org, The Humanitarian Data Exchange, and the countries' statistical offices. Since rounds 3 through 6 were conducted between 2002 and 2015, I tracked all changes to the administrative boundaries and headquarters during that time period.<sup>21</sup> I calculated a village's distance to its administrative headquarter as well as the distance to the administrative boundary and determined which border region it belongs to. Table A1 in the Appendix provides a list of the countries in my sample and the administrative units that are used. The data of geo-coded headquarters and shapefiles, as well as the R package and code to calculate the distances, will be available on the author's website. Figure A3 in the Appendix shows the resulting data for Burundi: it maps the administrative divisions and headquarters, as well as all villages in the Afrobarometer, with at least one observation within 5km of each side of a border.

## **Power of Traditional Leaders**

In order to study how the institutional context shapes the role of traditional leaders when the nation state is absent, I apply the empirical strategy outlined in Section III using questions in the Afrobarometer survey that ask about the role of traditional leaders and attitudes towards them. Specifically, I create a Z-score for the power of chiefs in the community by combining questions on how much influence chiefs have in the community, whether they are seen as corrupt or trustworthy, and how many times the respondent has been in contact with the chiefs. A list with the exact question wording can be found in the Appendix. I also show robustness to using the individual variables instead of the index.

## **Rural Welfare**

The DHS data allow me to construct several indicators of rural welfare. First, I use a measure of literacy based on whether respondents can read a sentence shown to them by the

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<sup>21</sup>Cross-referencing my data with Grossman and Lewis (2014) suggests high levels of accuracy.

enumerator. Second, the data contain a measure of the wealth of the household. Third, I construct a measure of infant mortality by dividing the number of children who have died before turning 5 over the total amount of births. Fourth, I create an indicator for the use of traditional medicine by combining whether respondents have sought traditional medicine when their child had fever, diarrhea, or as a method for birth control. Fifth, the DHS data provide information on migration by asking respondents whether they still live in the location they were born. Sixth, I construct state capacity outcomes and combine them in an index: whether children have birth certificates and vaccination cards, whether the family has electricity, and whether the household has piped water.

## **Institutional Variation**

Data on institutional variation is obtained by examining constitutional role of traditional leaders in every country in the sample. The text of all constitutions comes from the Constitute Project.<sup>22</sup> For each country, I have coded whether the constitutions give traditional leaders an official role e.g. by establishing a House of Chiefs, recognizing traditional courts, or recognizing the role of chiefs in local governance. Such passages in a country's constitution are evidence for institutional linkages between the state and traditional leaders. Panel B in Figure 4 shows which countries have institutionalized chiefs via their constitution. Moreover, I use a dataset of constitutional chief inclusion compiled by Baldwin (2016). The dataset categorizes the constitutions of 23 African countries on whether they mention traditional leaders and whether or not they protect chiefs. I identify the protection of chiefs in the constitution as an indication of the central state cooperating with traditional leaders and creating institutional linkages.

## **Data from the Democratic Republic of the Congo**

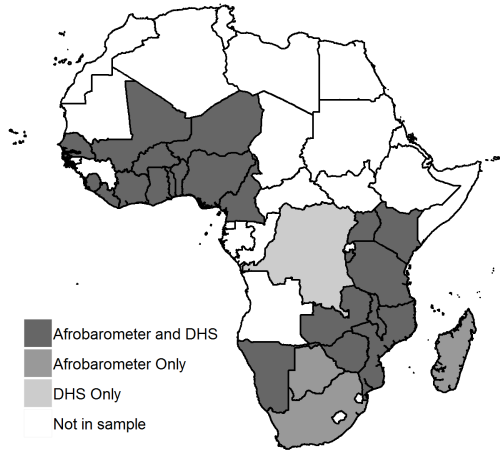
Additionally, I use survey data and behavioral measures from villages in the DRC collected by Henn, Marchais and Sanchez de la Sierra (2018). The data offer detailed questions about traditional leaders in 99 villages in the North Kivu province of the DRC. Villagers were asked about all village chiefs of the last 25 years; specifically, how much influence they had, what public goods they provided, and how popular they were. Similar to the Afrobarometer responses, such survey measures could be biased by social desirability bias, fear of retribution, or other factors. A less biased measure comes from Implicit Association

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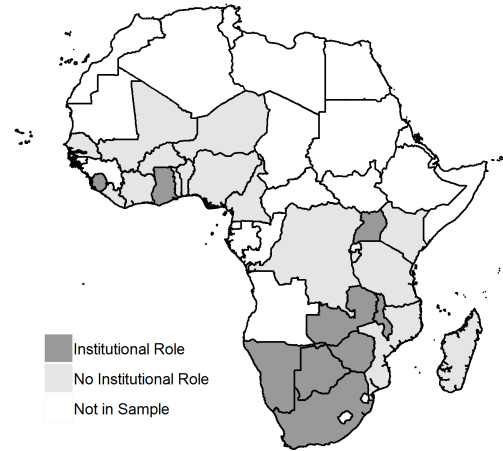
<sup>22</sup><https://www.constituteproject.org>

Figure 4: Map of Sample

Panel A: Countries in the Sample



Panel B: Institutional Variation



Tests (IAT), a behavioral test that aims to elicit implicit attitudes towards concepts. A detailed explanation of IATs and implementation can be found in the Appendix and in Henn, Marchais and Sanchez de la Sierra (2018). Henn, Marchais and Sanchez de la Sierra (2018) conducted IATs with villagers to measure their implicit attitudes towards traditional rulers, the state, and other local institutions. Furthermore, I collected qualitative interviews with chiefs in more than 20 villages in order to obtain a more complete picture of what traditional leaders do in their community and how they interact with the state.

## Geographic Controls

Lastly, I obtain geographical and historical variables from a wide array of sources to use as controls and to check the balance of the sample. They include the distance to the national capital, the distance to the national border, distance to the coast, elevation, ruggedness, agricultural suitability, malaria suitability, distance to historical cities, distance to Christian missions, and distance to colonial railroads. A full list and detailed descriptions of the methodology and sources can be found in the Appendix.

## Combined Sample

The combined data are then aggregated to the location (i.e. village or neighborhood) level, resulting in a sample of 17,225 unique locations for the Afrobarometer data and 34,974 for the

DHS. Restricting to locations with at least one observation within 5km of each side of a border and dropping extreme outliers results in a sample of 1,129 locations for the Afrobarometer data and 3,842 for the DHS data. Table A2 in the Appendix shows the summary statistic for this regression sample and reveals a majority rural and remote sample. Villages are, on average, 15km away from their administrative headquarters and over 150km away from the national capital. Half the respondents are literate, and average infant mortality is at 12%. Notably, there is very little migration. Over 95% of respondents in the DHS have always lived in the location where they were surveyed, and only 20% of children do not live at home.

## V Results

First, I test whether state presence — measured by the indices created from state presence-related outcomes in the Afrobarometer and DHS — does indeed change discontinuously at the border. To that end, Table 2 shows the results of the main specification, with state presence as the dependent variable. Both the data from the Afrobarometer (column 1) and the DHS (column 2) reveal a sizable and significant jump in state presence. Enumerators report significantly lower levels of state presence on the side of the border farther away from the administrative headquarters, indicating that the empirical strategy is successful in identifying a jump in state presence. Furthermore, the effect is sizable. Increasing treatment by one standard deviation reduces the index of state capacity outcomes by a tenth of a standard deviation.

### Institutional Choices

Subsequently, I test whether this change in state presence affects the power of traditional leaders. I begin by looking at the effect in the pooled sample of all countries, then run the interaction with institutional setting, and finally split the sample by institutionalization of chiefs.

In the pooled sample, running the same specification on the local power of the chief as measured by the chief z-score from the Afrobarometer data reveals no effect of state presence (Column 1 in Table 3). This is not surprising considering that the Afrobarometer sample contains countries with very distinct institutional setups and thus different state-chief relationships.

Next, Table 3 shows the effect of interacting treatment with institutionalization of traditional leaders (Column 2). The treatment effect is strongly positive, meaning chiefs become more powerful when the state is weak and they are not institutionalized. Yet, the inter-



Table 2: Effect of Treatment on State Presence Index

	<i>Dependent variable:</i>	
	State Presence Index	
	Afrobarometer	DHS
	(1)	(2)
Low State Presence Treatment	-0.115** (0.051)	-0.085*** (0.019)
Fixed effects?	Yes	Yes
Cluster	Admin. Unit	Admin. Unit
Observations	936	2,930
Adjusted R <sup>2</sup>	0.521	0.624
Clustered standard errors in parentheses	*p<0.1; **p<0.05; ***p<0.01	

Notes: This table shows the results of OLS regressions with state presence as the dependent variables. Following the main specification, the treatment variable is the intensive measure of how much the distance to the administrative headquarter is larger than on the other side of the internal administrative border while controlling for the distance to the administrative headquarter and its interaction with treatment variable. The sample is restricted to respondents who live within 5km of the internal administrative boundary. In order to only compare respondents in neighboring districts, I include border region fixed effects. Standard errors are clustered at the district level. An observation corresponds to a geographic location (i.e. village or neighborhood). Column (1) uses data from the Afrobarometer. The standardized state presence z-score combines local development, public good provision, and average of respondents who report having paid taxes. Column (2) uses data from the DHS. The state presence z-score combines electrification, registered births and time to the nearest water source.

action is negative, indicating that chiefs lose influence farther away from the state when they are institutionalized. Again, the effect is sizable. A one standard deviation increase in treatment decreases (increases) the power of the chief by three (two) tenths of a standard deviation when chiefs are (not) institutionalized. To further examine this pattern, Columns 3 and 4 subset the data by countries where chiefs are not given an institutionalized role in the constitution (Column 3) vs countries where they are institutionalized (Column 4). As predicted, the results show heterogeneity by institutional context. Chiefs become stronger in villages farther away from the state — they act as substitutes — but only when they are not institutionalized by the constitution (and thus institutionally separated). When chiefs are institutionalized in the constitution (and thus institutionally linked to the state), this relationship is reversed. Their role decreases farther away from the state — they act as complements.

Table 3: Effect of State Presence on Chief Power

	<i>Dependent variable:</i>			
	Chief Z-Score			
	Pooled Sample	Pooled Sample	Not Institutionalized	Institutionalized
	(1)	(2)	(3)	(4)
Low State Presence Treatment	-0.022 (0.037)	0.194*** (0.066)	0.176*** (0.066)	-0.094** (0.042)
Treatment X Institutionalized		-0.279*** (0.077)		
Fixed effects?	Yes	Yes	Yes	Yes
Cluster	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit
Observations	635	635	213	422
Adjusted R <sup>2</sup>	0.586	0.595	0.547	0.570

Clustered standard errors in parentheses

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Notes: This table shows the results of OLS regressions by institutional context with the chief z-score as the dependent variable. The chief z-score combines respondents' perception of traditional leaders' local influence, corruption, trust, and contact with the population. Following the main specification, the treatment variable is the intensive measure of how much the distance to the administrative headquarter on one side is larger than on the other side of the internal administrative border while controlling for the distance to the administrative headquarter and its interaction with the treatment variable. The sample is restricted to respondents who live within 5km of the internal administrative boundary. In order to only compare respondents in neighboring districts, I include border region fixed effects. An observation corresponds to a geographic location (i.e. village or neighborhood). Standard errors are clustered at the district level. The first Column (1) shows the result for the pooled sample. Column (2) interacts treatment with whether traditional leaders are institutionalized via a country's constitution. Column (3) subsets the data to countries that do not give chiefs an institutional role via their constitution. Column (4) subsets the data to countries that do institutionalize chiefs in their constitution.

Table 4 shows the result separately for the different components of the chief z-score. All of them show a positive effect of the low state presence treatment at the border and a negative coefficient of its interaction with institutionalization. A5 in the Appendix offers two alternative measure of legal inclusion according to Baldwin 2016, namely whether the constitution protects or mentions chiefs. The results closely mirror those of the previous table.

Table 4: Effect of State Presence on Components of Chief Z-Score

	<i>Dependent variable:</i>				
	Chief Z-Score (1)	Influence of Chief (2)	Contact with Chief (3)	Trust in Chief (4)	Chief not Corrupt (5)
Low State Presence Treatment	0.194*** (0.066)	0.411*** (0.112)	0.216** (0.096)	0.086 (0.087)	0.226*** (0.081)
Treatment X Institutionalized	-0.279*** (0.077)	-0.827*** (0.264)	-0.252** (0.106)	-0.098 (0.100)	-0.240** (0.110)
Fixed effects?	Yes	Yes	Yes	Yes	Yes
Cluster	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit
Observations	635	139	635	478	478
Adjusted R <sup>2</sup>	0.598	0.536	0.564	0.529	0.434

Clustered standard errors in parentheses

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Notes: This table shows the results of OLS regressions with the chief z-score and its components as the dependent variable. The chief z-score combines respondents' perception of traditional leaders' local influence, corruption, trust, and contact with the population. Following the main specification, the treatment variable is the intensive measure of how much the distance to the administrative headquarter on one side is larger than on the other side of the internal administrative border while controlling for the distance to the administrative headquarter and its interaction with the treatment variable. The sample is restricted to respondents who live within 5km of the internal administrative boundary. In order to only compare respondents in neighboring districts, I include border region fixed effects. An observation corresponds to a geographic location (i.e. village or neighborhood). Standard errors are clustered at the district level. Column (1) uses the chief z-score as the dependent variable as in Table 3. The other columns use the sub-indicators of the z-score as the dependent variable. Column (2): How much influence do traditional leaders currently have in governing your local community? Column (3): During the past year, how often have you contacted any of the following persons about some important problem or to give them your views: A traditional ruler? Column (4): How much do you trust each of the following, or haven't you heard enough about them to say: Traditional leaders? Column (5): How many of the following people do you think are involved in corruption, or haven't you heard enough about them to say: Traditional leaders? (Inversed).

## Consequences for Rural Welfare

How does the interaction between the state presence and traditional leaders affect rural welfare? Institutional choice by the central state to institutionalize traditional leaders will have important implications for local public service delivery. The previous results have shown that when traditional leaders are institutionalized, their local influence decreases when the state

is weak. This is likely going to hinder their ability to mobilize resources and provide public goods locally. When traditional leaders are institutionally separated on the other hand, their local influence increases when the local state is weak, enabling them to step in and substitute for a weak local state. Table 5 uses data from the DHS to investigate whether the institutional choices also mediate how local state presence affects rural welfare. Specifically, the DHS data allows me to create measures of literacy and wealth, two outcomes of local development that I argue chiefs have some influence over. They affect literacy by organizing the construction and maintenance of classrooms and can be an important mechanism for villagers to coordinate the hiring and payment of teachers.<sup>23</sup> By allocating land, administering local justice, and organizing public works (e.g. road maintenance), traditional leaders can influence economic development in their village. Additionally, I look at infant mortality as an example of a public service that traditional leaders cannot substitute for the state. Impacting health outcomes and infant mortality specifically requires detailed knowledge and extensive infrastructure that is beyond the capabilities of most chiefs. Traditional leaders are aware of this, and therefore focus on public services where they have a comparative advantage.<sup>24</sup> Instead, chiefs often promote the use of traditional medicine, which at best has negligible health benefits and at worst is detrimental to the patient's health (Miller and Skinner, 1968; Mokgobi, 2014). I construct a measure of traditional medicine use by combining whether respondents have sought traditional medicine when their child had fever, diarrhea, or as a method for birth control.

Table 5 reveals a pattern in line with the findings from the Afrobarometer data. Countries where traditional leaders are not protected by the constitution exhibit a smaller drop in wealth and literacy farther away from the state. This indicates that traditional leaders are better able to step in and compensate for the weak state when they are not institutionally linked to it. However, the results reverse when looking at infant mortality. Here, institutional separation induces worse outcomes when far away from the state. The effect on use of traditional medicine, gives some indication of why health outcomes might deteriorate in this setting. Low state capacity in countries with institutional separation (i.e. more influential chiefs when the state is weak) seems to increase reliance on traditional medicine, while it does not in countries where chiefs are linked to the state.

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<sup>23</sup>Qualitative Interview L5 and L6, May 2018, North Kivu province, DRC.

<sup>24</sup>Qualitative Interview L2, July 2018, North Kivu province, DRC.

Table 5: Effect of State Presence on Public Good Outcomes

	<i>Dependent variable:</i>			
	Literacy (1)	Wealth (2)	Infant Mortality (3)	Trad. Medicine (4)
Low State Presence Treatment	-0.028** (0.012)	-0.076*** (0.022)	0.035 (0.026)	0.047 (0.032)
Treatment X Institutionalized	-0.057** (0.027)	-0.121*** (0.040)	-0.102** (0.051)	-0.104** (0.044)
Fixed effects?	Yes	Yes	Yes	Yes
Cluster	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit
Observations	2,623	2,883	2,650	2,477
Adjusted R <sup>2</sup>	0.816	0.711	0.416	0.211

Clustered standard errors in parentheses

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

This table shows the results of OLS regressions on several outcome variables from the DHS survey. Following the main specification, the treatment variable is the intensive measure of how much the distance to the administrative headquarter on one side is larger than on the other side of the internal administrative border while controlling for the distance to the administrative headquarter and its interaction with the treatment variable. The sample is restricted to respondents who live within 5km of the internal administrative boundary. In order to only compare respondents in neighboring districts, I include border region fixed effects. An observation corresponds to a geographic location (i.e. village or neighborhood). Standard errors are clustered at the district level. Column (1) looks at literacy. Column (2) shows the results on wealth. Column (3) considers infant mortality, and Column (4) shows results on a z-score of trust in traditional medicine (a combination of whether traditional healers were visited when children had fever or diarrhea or whether traditional methods of birth control were used).

## VI Robustness Checks

The following section shows robustness to a range of different specifications and measurements; most notably, the determinants of institutional linkages, the validity of the assumptions underpinning the regression discontinuity design, different choices for the main specification, and the possible endogeneity of administrative borders and headquarters.

Throughout the robustness checks, the results remain qualitatively the same: distance to the state leads to an increased role of traditional leaders when the state and the chiefs are institutionally separated. When both are linked, the chiefs act as complements and their role decreases when the state is weak.

### Endogeneity of Institutional Linkage

The spatial regression discontinuity design provides exogenous variation in state presence, allowing for a causal interpretation given certain assumptions. Since the main finding involves the interaction with institutional linkages, the question arises whether these might be endogenously determined, which might bias the results.

Previous research has identified democracy as a factor in determining this decision (Baldwin, 2016). Electoral incentives make governments more likely to recognize customary authority in an attempt to use them as electoral agents. Colonial background is another factor influencing the state-chief relationship, as British colonizers were more likely to use existing traditional hierarchies as administrators (Crowder, 1968). Local economic resources further determined the state's interest in a given area and subsequent cooperation with local elites (Boone, 2003). At the same time, states with higher capacity are more likely to be able to sidestep the chiefs (Herbst, 2000), and decentralization policies determine how much local influence and independence the central state seeks to establish (Bardhan and Mookherjee, 2006).

To first test whether institutional linkages correspond with other country-level variation, I collect several country-level variables and perform two-sided t-tests. I focus on variables in three categories: a) historical institutions such as pre-colonial centralization, settler colonies, or whether the country was a British colony; b) geographic determinants of economic activity and vulnerability, such as soil quality, malaria suitability, or ruggedness; and c) more recent measures of institutions such as rule of law, democracy index or failed state index. Table A6 shows the covariate balance. Out of 21 variables, only 2 (whether the country was a British colony and whether the legal system is based on the British system) differ significantly<sup>25</sup> between where traditional leaders are institutionalized from when traditional leaders are not

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<sup>25</sup>Note that the sample size is only 23 countries.

institutionalized. To test whether these differences are driving results, I rerun the analysis for all covariates, with  $p < 0.2$  interacting treatment with the covariate.<sup>26</sup> The results are shown in Table A7. Even when interacting treatment with these potential confounders, the interaction of treatment and institutionalization remains sizable, negative, and statistically significant.<sup>27</sup>

## Testing the RDD assumption

Two underlying assumptions are crucial for the causal validity of any regression discontinuity specification: smooth variation of covariates and no sorting around the cutoff.

If treatment is indeed as if random around the border and not the result of confounding factors, treatment should not have an effect on pretreatment covariates. In the case of changes in state presence, few potential variables are pretreatment. Therefore, to test the balance of my sample, I run the main specification on a set of geographical and historical variables. The results are reported in Table A4 in the Appendix. Two out of ten are significantly different on the side of the border farther away from the state — distance to the national border and distance to colonial railways. A look at the observations on the map and sensitivity analysis finds that this is driven by observations from one country (Cameroon).<sup>28</sup> Still, all variables in the table and their interaction with institutionalization of chiefs are included as controls in the main analysis.<sup>29</sup>

For observations on both sides of the border to be comparable, there must be little or no sorting. I.e. chiefs and citizens should not move across internal borders to be closer or farther away from the state. One indication for sorting would be different densities on both sides of the border. To test for this, I perform McCrary tests on the Afrobarometer sample for the different bandwidth specification, the results of which can be seen in Figure A4. There seems to be no significant variation in density on both sides of the cutoff. Second, I use the DHS data to test whether the low state capacity treatment induces migration on either side of the border. Table A3 in the Appendix shows that neither migration by children, men, or women, nor an indicator combining the three, is significantly different on one side of the border.

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<sup>26</sup>I also interact treatment with all other variables in Tables B5 and B6 in the Online Appendix.

<sup>27</sup>The coefficient for the specification with malaria suitability is not significant ( $p=0.12$ ), yet goes in the same direction and is of similar magnitude. In the main specification, I control for a more local measure of malaria suitability.

<sup>28</sup>Figure A5 shows that dropping each country individually from the analysis does not affect the results.

<sup>29</sup>I also run the analysis without using controls in Column 2 of Table A8, and the results remain consistent.

## Different Specifications

The choice of optimal bandwidth is a crucial step in any regression discontinuity design. Various strategies exist to select an optimal bandwidth (Imbens and Kalyanaraman, 2012; Calonico, Cattaneo and Titiunik, 2014). The matched regression discontinuity design in this paper, however, creates inconsistent estimators for the optimal bandwidth.<sup>30</sup> In order to check the robustness of these results, I vary the bandwidth between 3 and 20 kilometers. Sample size restricts the possibility to use bandwidths smaller than 3km, and larger bandwidths than 20km become less meaningful from an identification standpoint, as villages can be up to 40km away from each other and are thus less comparable. The results can be seen in Figure 5. The results follow general regression discontinuity specifications, larger but less precise coefficients when using smaller bandwidths. No matter the bandwidth choice, chiefs remain substitutes from the state when not institutionalized by the constitution and they show the opposite relationship when being institutionalized. Still, the associated confidence intervals may not have correct coverage even if the estimator is unbiased, suggesting that it might be appropriate to use a higher critical value (Armstrong and Kolesar, 2017). Both the difference between treatment coefficients of the institutionalized and not institutionalized samples and the coefficient in the interaction specification surpass the most conservative critical value of 2.8.

The main specification uses an intensive treatment measure that indicates how much the distance to the administrative headquarter on one side is larger than on the other side of the internal administrative border. This intensive treatment measure is then scaled by the country and administrative division specific effect of distance on state presence outcomes. The results hold when using a more standard specification with a binary treatment indicator (Column (3) in Table A8 in the Appendix). Removing the scaling of treatment by the country and administrative division specific coefficient of distance on state presence also does not change the findings (Column (4) in Table A8 in the Appendix).

To ensure my choice of specification does not impact the results I run a Cubic Polynomial RD specification similar to Dell (2010) (Column (5) in Table A8 in the Appendix). Furthermore, I also conservatively cluster the standard errors at the highest administrative division instead of the lowest (Column (6) in Table A8 in the Appendix).

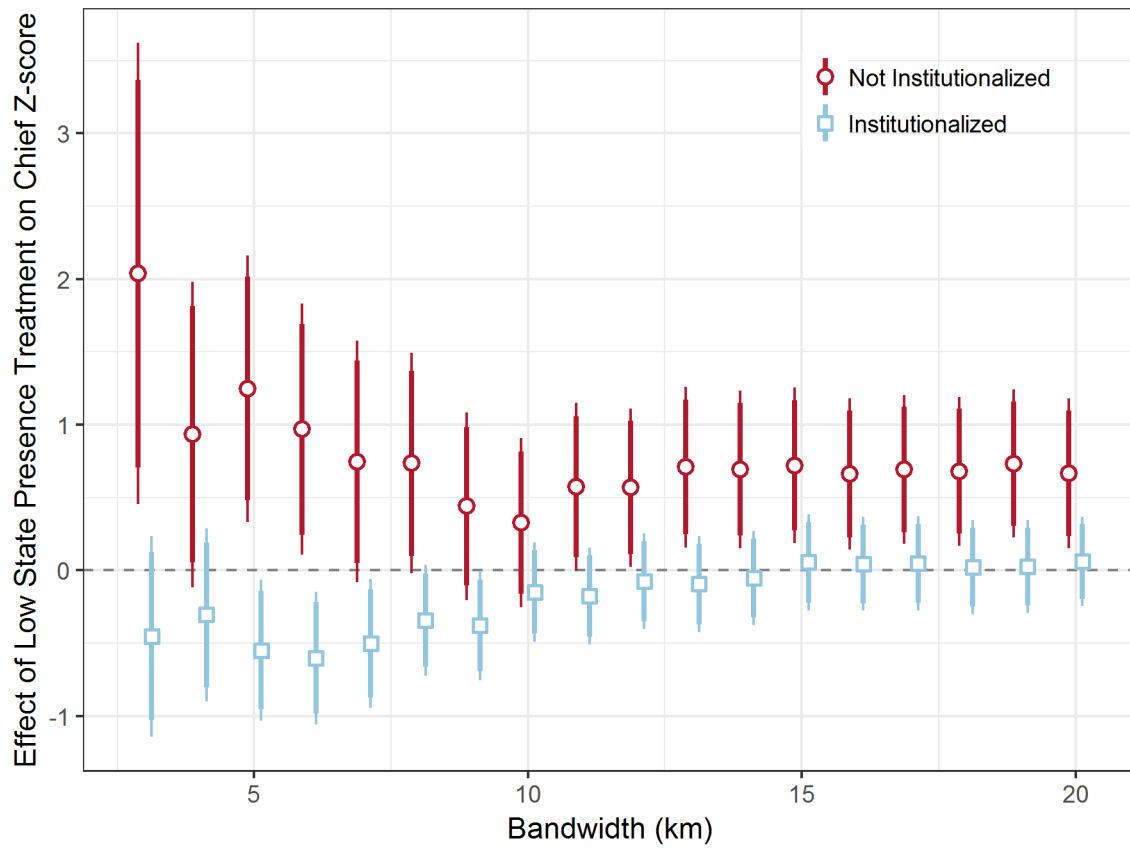
The specification could also be sensitive to the inclusion or exclusion of outliers, both in

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<sup>30</sup>This is due to the matching aspect of the specification. In a normal RD setting, extending the bandwidth from  $X$  to  $X+1$  only adds observations that are between  $X$  and  $X+1$  from the cutoff. In this case, however, increasing the bandwidth from  $X$  to  $X+1$  will not only add observations between  $X$  and  $X+1$  from the cutoff but also their matched observations on the other side of the border, which could be anywhere from 0 to  $X+1$  from the cutoff. Thus, the variance bias trade-off calculated by the standard optimal bandwidth algorithms is not consistent.



Figure 5: Changing the Bandwidth



This figure shows the effect of the treatment measure on the dependent variable of Table 3 using different bandwidths. 3-20 kilometers are used as bandwidths. The 95% and 90% confidence intervals are plotted for each bandwidth.

terms of extreme values of the explanatory variable as well as specific countries. To make sure the results are not affected, I drop extreme outliers that are more than 100 km and 50 km away from the administrative headquarters in Columns (2) and (3) of Table A9, respectively, in the Appendix. In Figure A5 in the Appendix, I show the results dropping one country at a time. Column (4) of Table A9 does not restrict to border segments by also including villagers whose nearest village on the other side of the border is farther than 30 km.

More generally, the results are also robust to different typical geographic regression discontinuity specifications. While the logged distance is used in the main specification due to its favorable properties (Campante and Do, 2010), the non-logged distance is used in Column (5) in Table A9. A more realistic measure of state presence could be obtained by using travel time between villages and administrative headquarters. Travel time is linked to infrastructure investments that could be affected by state presence or the state-chief interaction. Nevertheless, the results remain consistent when using logged travel time (Column (6) of Table A9 in the Appendix).<sup>31</sup>

## Endogenous Borders and Headquarters

Previous studies have found spillovers in state capacity (Acemoglu, Camilo and Robinson, 2015). If local state capacity spillovers were sizable in the African context, it would downward bias my results and reduce the potency of the regression discontinuity design. To test whether such spillovers influence the results, I control for a village's distance to the administrative headquarters in the neighboring administrative unit (Column (2) in Table A10 in the Appendix).

A concern in this particular regression discontinuity design might be that the locations of the administrative borders and headquarters are not random. Indeed, both the boundaries and the district capitals are likely to be the result of economic and political processes. Scholars have demonstrated, for example, that African governments routinely create more lower-level administrative units as part of political bargaining processes (Grossman and Lewis, 2014). However, the endogeneity of borders and headquarters is unlikely to impact the results of this study, since both decisions are unlikely to be based on the particular villages and chiefs surveyed. Borders follow natural boundaries such as rivers or are straight lines and rarely altered for individual villages or chiefs. In other words, a strong local chief is unlikely to have the ability to influence the drawing of borders to put her village in a district with high or low state presence.

Since the splitting of districts and the redrawing of boundaries is more prevalent in lower

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<sup>31</sup>Following methodology by Alegana et al. (2012) I use, altitude, land cover, rivers, and road network to calculate the travel time between a village and its administrative headquarters.

administrative divisions, I run the results separately for the first and second administrative divisions of the countries in my sample (Columns (3) and (4) in Table A10 in the Appendix). Additionally, if borders were drawn to explicitly include or exclude a particular village, the boundary should be right next to the village. To exclude such potential cases I run a “Donut” RDD, where I exclude all villages within 1km of the border (Column (5) in Table A10 in the Appendix).

Another omitted factor in the analysis that could create discontinuity at the border is ethnicity. If administrative borders consistently coincide with ethnic demographics, the results and their interpretations could be affected. Column (6) in Table A10 in the Appendix indicates that this is not a concern. When controlling for ethnicity fixed effects based on the pre-colonial locations of ethnic groups, the results remain virtually unchanged.

Similarly to administrative boundaries, the location of headquarters is not based on the power of local chiefs but typically follows population density or economic activity: the biggest or economically most important village or town becomes the administrative capital. While these factors determine the location of the capital, they don’t change discontinuously at the border. The fact that controlling for the distance to the neighboring headquarters does not affect the results (Column (2) in Table A10 in the Appendix) and the low level of migration (Table A2 and A3) supports this.

Still, in some cases, the location of the capital might be influenced by a particular influential chief. To make sure the results are not driven by this phenomenon I use the most populated place in each district in 1960<sup>32</sup> to instrument for the location of the district capitals. Putting the distance to the instrumented capitals in the specification returns similar results (Column (7) in Table A10 in the Appendix). Lastly, I also run a placebo test where I chose a random location within an administrative division as the headquarter and estimate the effect of its distance on local chief power. The result can be seen in Column (8) in Table A10 in the Appendix. Reassuringly, distance to these placebo headquarters does not result in sizable or significant effects, whether chiefs are institutionalized or not.

## Chiefs in the DRC

The Afrobarometer and DHS data provide strong evidence for substitution and complementary in different African settings. However, the data from the Afrobarometer might be subject to response bias if respondents do not answer questions about their village chiefs and the state truthfully. Data from the DRC allow me to test these measurement concerns via behavioral measures and precise survey questions. Specifically, Henn, Marchais and Sanchez

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<sup>32</sup>Earlier data on population density is not disaggregated enough.

de la Sierra (2018) conducted Implicit Association Tests (IAT), a behavioral test to elicit implicit attitudes towards village chiefs and the state in 99 villages in the North-Kivu province of the DRC. They also surveyed villagers about the governance of their village and attitudes towards the village chiefs. The constitution of the DRC does not institutionalize chiefs.<sup>33</sup> My fieldwork confirms that traditional rulers and the state do not systematically cooperate in a formal framework. The theory would then indicate the influence of traditional rulers to be a substitute to the power of the strength. Table 6 uses different measurement strategies to test this claim.

First, Column (1) validates the use of distance as a determinant of state presence. According to IAT results, the state is viewed less positively farther away from local administrative headquarters. Column (2) shows that IAT scores of village chiefs go in the opposite direction and increase with distance to the state. Encouragingly, the IAT scores are correlated with survey measures shown in Columns (3) to (5). In villages farther away from local administrative headquarters, chiefs are reported to have more power and popularity. In line with the cross country findings, chiefs in the DRC appear to act as substitutes to state presence.

Table 6: Effect of State Presence on Role of Local Institutions in the DRC

	<i>Dependent variable:</i>				
	State IAT (1)	Chief IAT (2)	Power to Mobilize (3)	Power to Influence (4)	Chief Liked (5)
Log Distance to Admin. HQ	-0.103*** (0.032)	0.096** (0.037)	0.022* (0.013)	0.029** (0.014)	0.054** (0.022)
Fixed effects?	Territoire	Territoire	Territoire	Territoire	Territoire
Cluster	Territoire	Territoire	Territoire	Territoire	Territoire
Observations	71	86	99	99	96
Adjusted R <sup>2</sup>	0.216	0.031	0.125	0.163	0.167

Clustered standard errors in parentheses

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

This figure shows the coefficient of the log distance to the local administrative headquarter on several outcome variables using a survey conducted by Henn, Marchais and Sanchez de la Sierra (2018) in the DRC. The administrative level of question here is the territoire and territoire fixed effects are included and standard errors are clustered at the territoire level. Ten respondents were surveyed in each village, from which averages of the outcome variables were created. Column (1) shows the results on the average IAT score of the Congolese state in the village. Column (2) looks at the IAT score of village chiefs. Column (3) shows the result on whether the chief has the power to mobilize the population. Column (4) on whether the chief has the power to influence the population. Column (5) on whether the chief is liked.

<sup>33</sup>Chiefs are mentioned in the constitution but are not assigned a formal role.

## VII Implications of Findings

The findings from Section V suggest that the interaction of the nation state and traditional leaders hinges critically on whether or not a country's constitution institutionalizes chiefs. In the following section I examine what these results imply for the state-chief relationship at the national level and show that my causal estimates of the effects of state presence on the power of chiefs at the local level are in line with correlational evidence on the country level.

First, my results suggests that in countries where traditional leaders are not institutionalized, the influence of chiefs will decline as state strength increases. Rwanda can be seen as an example for this mechanism. Traditional leaders do not have an official role in the Rwandan constitution, and with the emergence of a successful developmental state in Rwanda, traditional leaders play virtually no role anymore (Ansoms, 2009; Ingelaere, 2010). Instead, the Rwandan state has created its own effective local government apparatus that reaches into every village (Purdeková, 2011; Chemouni, 2014).

Yet, chiefs do not necessarily have to lose status when the state is strong. When traditional leaders are institutionalized, we should expect chiefs to be able to maintain their status even when the state is strong. South Africa offers a case in point with a successful state, yet chiefs remain influential (de Kadt and Larreguy, 2018). The state and the chiefs work together closely, and as a result traditional leaders become important brokers when dealing with politicians or administrators (Williams, 2010).

When the state is weak, similar heterogeneity should emerge. When traditional leaders are not institutionalized, they are able to gain local status when the state is weak. I have observed this mechanism during my fieldwork in the Democratic Republic of the Congo, where the state is all but absent and chiefs have maintained local influence by distancing themselves from the state. The Congolese state has repeatedly attempted to sideline customary authority, e.g. via privatizing land rights in 1973, but a vacuum of state presence has led to much influence being wielded by traditional leaders (Acker, 2005). The population often recognizes the chief as the only actor active in the community, and many chiefs explain their local efforts with the absence of public good provision by the state. As the only actors present in every locality, traditional leaders also become important intermediaries for non-state governance and development projects (Tull, 2003).

When traditional leaders are tied to a weak state, however, they lose influence. Traditional leaders suffer from their association with an underperforming regime, and a weak state is unable to monitor the local performance of chiefs. Zimbabwe offers an interesting case for this scenario. Originally, after independence in 1980, traditional rulers were not institutionalized, as the state saw them as incompatible with modernization and as an al-

Table 7: Empirical Implications

		<i>Institutionalized Chiefs?</i>	
		Yes	No
<i>State Capacity</i>	Strong State	Chiefs maintain status e.g. South Africa	Chiefs lose status e.g. Rwanda
	Weak State	Chiefs lose status e.g. Zimbabwe	Chiefs gain status e.g. DRC

ternative form of authority. Yet, as the state was unable to effectively project power into the countryside, traditional leaders increased their local influence and standing. Under political pressure, the ZANU-PF regime decided to incorporate chiefs and tap into their local authority (Ncube, 2011). Since their institutional inclusion, traditional leaders have become increasingly co-opted by the regime (Zamchiya, 2011). They have suffered from their association with a weak and violent state and are often seen as corrupt and abusive (LeBas, 2006; Bratton, 2011; Baldwin, Muyengwa and Mvukiyehe, 2017). Table 7 summarizes the empirical implications.

## VIII Conclusion

Traditional leaders play an important role in local politics and rural development in Sub-Saharan Africa. Still little is known, however, about what determines their local influence and how it is affected by their interaction with the state. This paper argues that how the strength of the nation state affects the power of traditional rulers hinges on the existence or absence of institutional linkages between chiefs and the state. When national institutions cooperate with chiefs and integrate them into the formal apparatus, it makes chiefs complements of the state by making them dependent on the local state for resources and legitimacy. However, when the nation state does not institutionalize the chiefs, both act independently from each other, and chiefs act as substitutes. Studying the effects of state presence is difficult due to the lack of fine-grained data, questions of how to measure state presence, and endogeneity concerns.

I address these challenges via a spatial regression discontinuity design that uses distance of villages to their administrative headquarters as a measure of state presence and compares villages in the border region of neighboring districts. Using geo-coded data from the Afrobarometer survey and information on the constitutional institutionalization of chiefs as a

source of variation in the institutional context, I find that the interaction between the state and traditional leaders depends on the institutional context. When chiefs are not given a formal role in the constitution (and thus not institutionalized), their role increases when the state is weak — they act as substitutes. In countries where chiefs are given a formal role in the constitution (and thus institutionalized), chiefs have a weaker role in the community when the state is weak — evidence for complementarity. This heterogeneity has important implications for rural welfare. Using data from the Demographics and Health Survey, I show that countries where traditional leaders are not institutionalized exhibit a smaller reduction in development outcomes when state presence is low, indicating that traditional leaders are able to substitute for the state.

The results have implications for the relationship between traditional rulers and state presence at the local and national level. Locally, it can help policy makers understand which traditional rulers are more influential, which are more independent, and how they are affected by state policies. At the country level, the results shed light on why traditional leaders remain influential in some successful states (e.g. South Africa) in contrast to predictions by modernization theory (Mamdani, 1996) while they have lost local standing in others (e.g. Rwanda). It further adds to our understanding of the incentives motivating politicians and traditional leaders when they bargain over institutional arrangements between the state and traditional authority.

The paper thus links the recently emerging literature on traditional chiefs to the literature on the effects of national institutions. It also adds to the literature on African institutional decisions by showing the profound consequences of constitutional inclusion of traditional leaders.

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# A Data Appendix

## Survey Questions

The Chief Z-score is composed of the following variables in the Afrobarometer survey:

- **Influence Chief:** “How much influence do traditional leaders currently have in governing your local community?” (Question 65 in Round 4)
- **Trust Chief:** “How much do you trust each of the following, or haven’t you heard enough about them to say: Traditional leaders?” (Question 49I in Round 4, Q52K in Round 6)
- **Corr Chief:** “How many of the following people do you think are involved in corruption, or haven’t you heard enough about them to say: Traditional leaders?” (Question 50H in Round 4, Q53H in Round 6)
- **Contact Chief:** “During the past year, how often have you contacted any of the following persons about some important problem or to give them your views: A traditional ruler?” (Question 23F in Round3, Q27B in Round 4, Q24E in Round 6)

## Control Variables

- **Distance to the Capital:** The distance of a village from the capital city, measured in kilometers. *Source: OpenStreetMap*
- **Distance to the National Border:** The distance of a village from the national border, measured in kilometers. *Source: Digital Chart of the World*
- **Distance to the Coast:** The distance of a village from the nearest coastline, measured in kilometers. *Source: Digital Chart of the World*
- **Elevation:** Average value of elevation for grid cells of 30 Arc-Seconds (equivalent to 250 meters), measured in meters above sea level. *Source: SRTM version 4.1 (NASA)*
- **Ruggedness:** Averaging the Terrain Ruggedness Index of 30 by 30 arc-second cell. It is measured by dividing the millimeters of elevation difference by the area of the 30 by 30 arc-second cell. *Source: Nunn and Puga (2012)*
- **Land Suitability for Agriculture:** The fraction of each grid cell that is suitable to be used for agriculture. It is based on the temperature and soil conditions of each grid cell. *Source: Atlas of the Biosphere*



Table A1: Administrative Divisions in Sample

Country	Admin Unit	# in 2002	# in 2005	# in 2008	# in 2012	# in 2015
Benin	department	12	12	12	12	12
Benin	commune	77	77	77	77	77
Botswana	district	15	15	16	16	16
Burkina Faso	province	45	45	45	45	45
Burkina Faso	department	351	351	351	351	351
Burundi	province	17	17	17	17	18
Burundi	commune	115	129	129	129	129
Cameroon	department	58	58	58	58	58
Cameroon	arrondissement	360	360	360	360	360
Cote d'Ivoire	department	58	70	81	107	108
Cote d'Ivoire	sub-prefectures				510	510
D.R.C	province	11	11	11	11	26
D.R.C	territory	166	166	166	166	166
Ghana	region	10	10	10	10	10
Ghana	district	110	110	170	216	216
Kenya	province	8	8	8		
Kenya	county				46	46
Liberia	county	15	15	15	15	15
Madagascar	region		22	22	22	22
Madagascar	district	110	110	114	114	114
Malawi	region	3	3	3	3	3
Malawi	district	27	28	28	28	28
Mali	cercle	49	49	49	49	49
Mali	commune	701	701	701	701	701
Mozambique	province	10	10	10	10	10
Mozambique	district	128	128	128	128	151
Namibia	region	13	13	13	13	14
Namibia	constituency	102	107	107	107	121
Niger	region	7	7	7	7	7
Niger	department	36	36	36	63	63
Nigeria	state	36	36	36	36	36
Nigeria	lga	774	774	774	774	774
Senegal	region	11	11	14	14	14
Senegal	cr	364	364	364	431	431
Sierra Leone	district	14	14	14	14	14
Sierra Leone	chiefdom	149	149	149	149	149
South Africa	district	53	53	52	52	
Tanzania	region	25	26	26	30	30
Tanzania	district	129	129	130	149	149
Togo	region	5	5	5	5	5
Togo	prefecture	31	31	31	36	36
Uganda	district	56	70	80	112	112
Zambia	province	9	9	9	10	10
Zambia	district	72	72	72	72	110
Zimbabwe	province	10	10	10	10	10
Zimbabwe	district	59	59	59	59	59

- **Distance to Historical Cities:** The distance of a village from the nearest historical city, measured in kilometers. *Source: Chandler (1987)*
- **Malaria Ecology Index:** The index takes into account the prevalence and type of mosquitoes indigenous to a region, their human biting rate, their daily survival rate, and their incubation period. The index has been constructed for 0.5 degree by 0.5 degree grid-cells. *Source: Kiszewski et al. (2004)*
- **Distance to Catholic and Protestant mission stations:** The distance of a village from the nearest Catholic or Protestant mission station, measured in kilometers *Source: Nunn (2010)*
- **Distance to Railroad:** The distance of a village from the nearest railroad built before 1960, measured in kilometers. *Source: Jedwab and Moradi (2015)*

## B Photos

Figure A1: Public Goods Provided by Traditional Leaders in DRC

Panel A: Meeting Room



Panel B: Bridge



Panel C: Water Tap



Panel D: Water Source



Panel E: Bricks



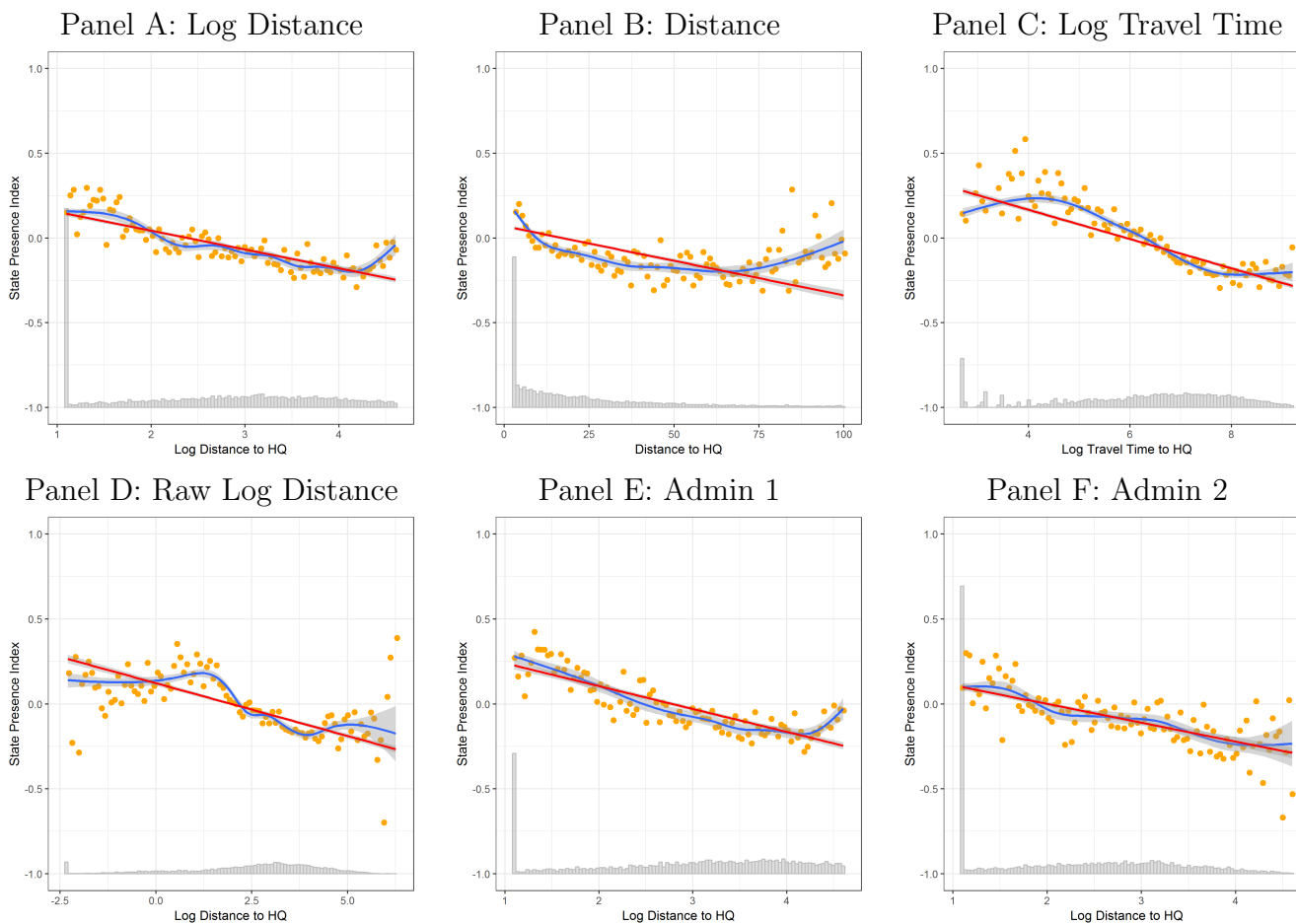
Panel F: Road Clearing



*Notes:* These pictures show public goods provided by chiefs in villages in the Democratic Republic of the Congo. The pictures were taken during the collection of qualitative interviews with village chiefs in more than 20 villages in the North and South Kivu provinces of the DRC.

# C Additional Figures

Figure A2: Plotting Distance to State Presence



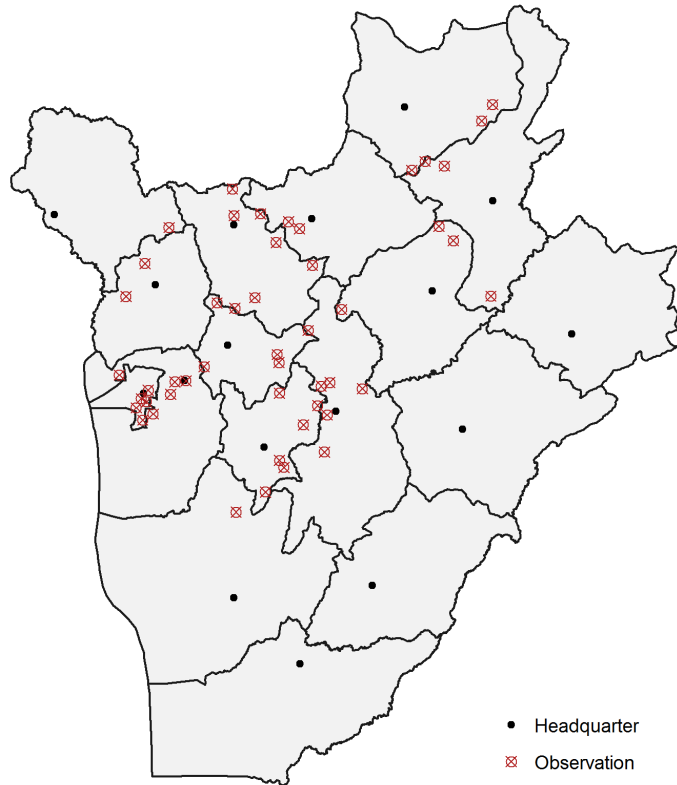
*Notes:* These figures show the bin-scatter (orange) of distance to the headquarters and an index of state presence as well as their linear (red) and polynomial relation (blue). A histogram of the distance measure is shown at the bottom of each figure. Panels A, B, C, E, and F have outliers removed and very close distances pooled. Panel D shows the raw logged data (distances of 0 are set to 0.1)



Figure A3: Borders, Headquarters, and Observations

Panel A: Admin Level 1 Burundi

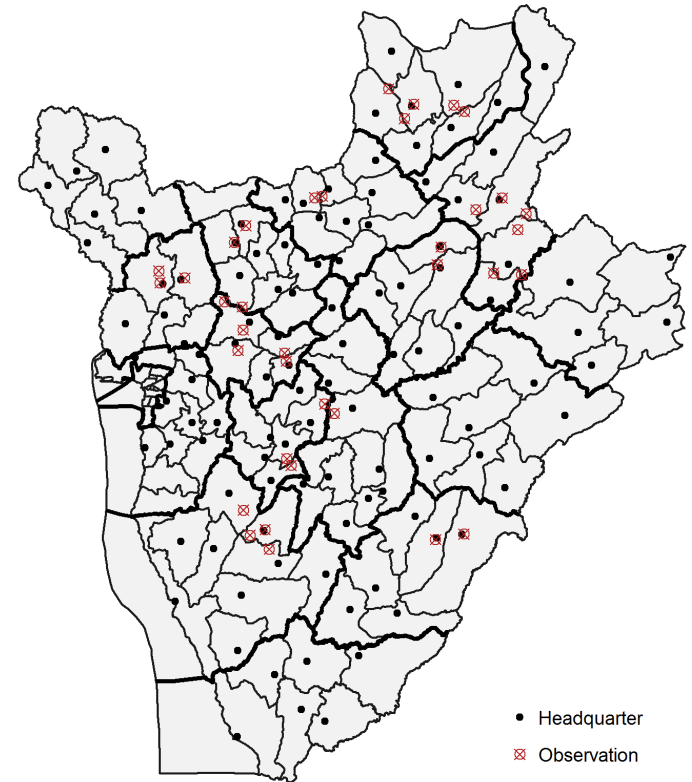
Province



• Headquarter  
⊠ Observation

Panel B: Admin Level 2 Burundi

Commune

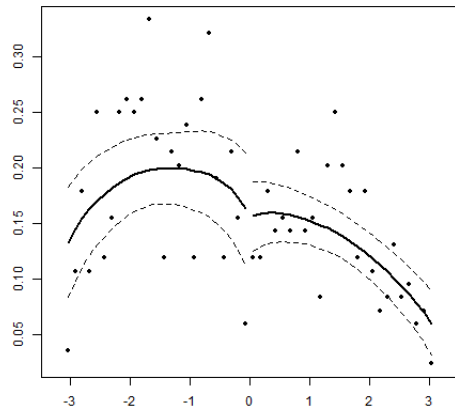


• Headquarter  
⊠ Observation

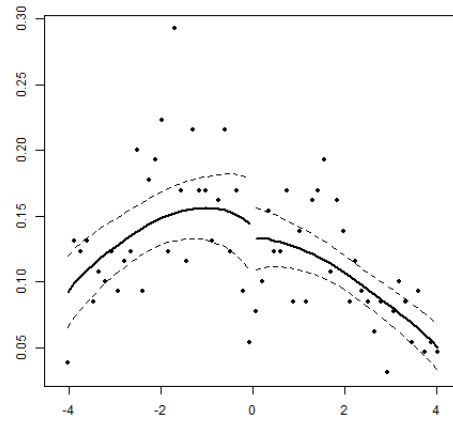
*Notes:* This figure maps the administrative divisions and headquarters of Burundi as well as all villages in the Afrobarometer data included in the sample (i.e. at least one observation within 5km on each side of an administrative border). Panel A uses the first administrative division, provinces. Panel B shows the second level, communes.

Figure A4: Results of McCrary Test with different bandwidths

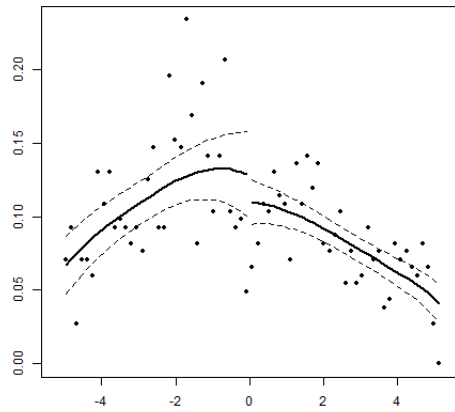
Panel A: 3km



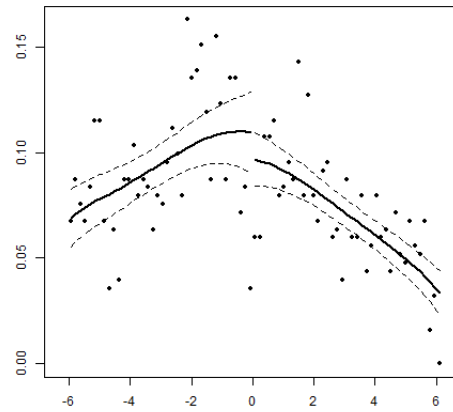
Panel B: 4km



Panel C: 5km

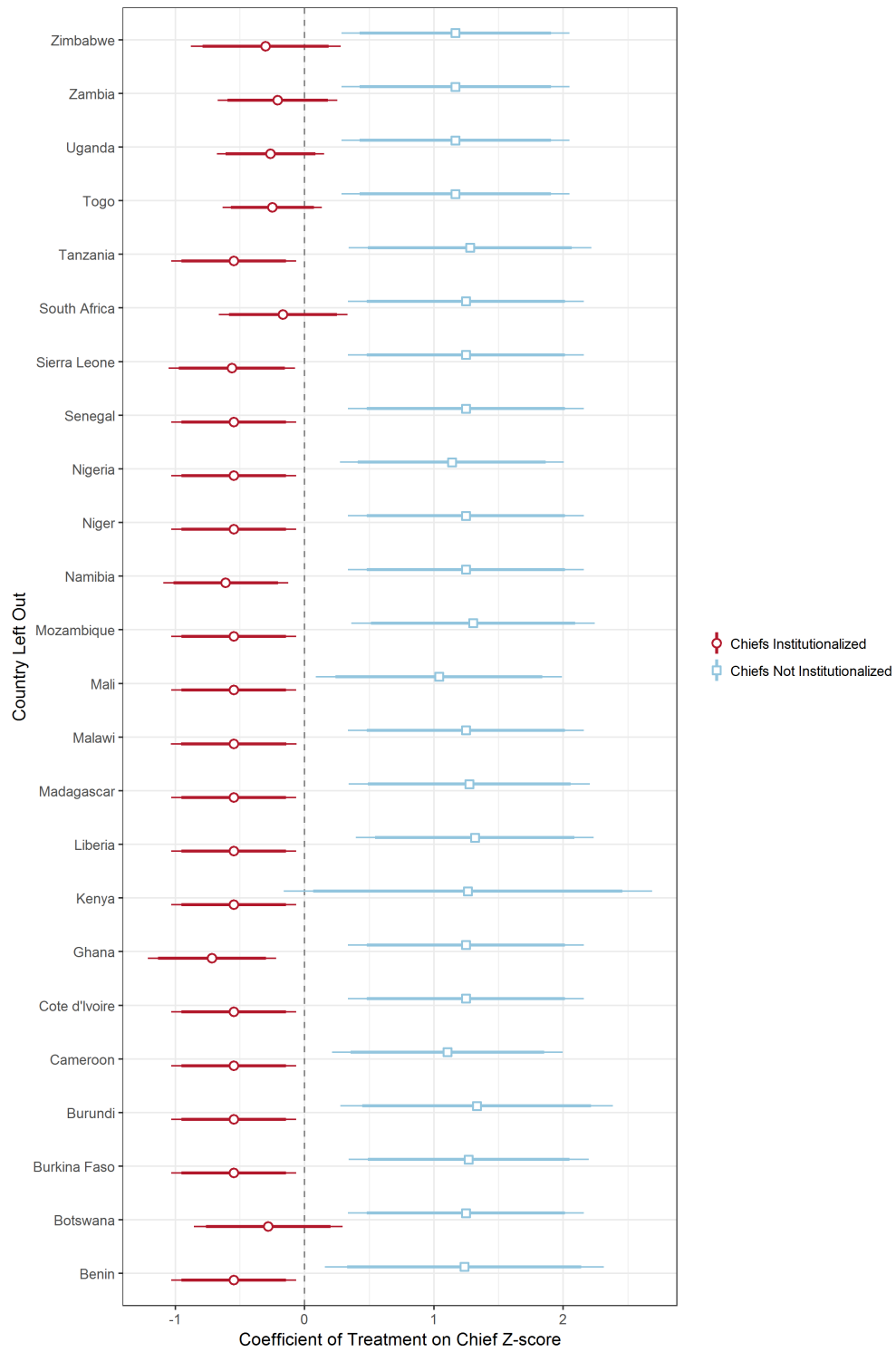


Panel D: 6km



*Notes:* These figures show the histogram and density estimations for the McCrary sorting test using different bandwidths (3, 4, 5, and 6km).

Figure A5: Results when leaving out individual countries



Notes: This figure shows the coefficients on the intensive treatment variable when leaving out individual countries from the analysis following the main specification in Table 3.

## D Additional Tables

### Summary Statistics

Table A2: Summary Statistics for Full Regression Sample

Statistic	N	Mean	St. Dev.	Min	Max
Distance to Headquarter (km)	4,971	15.51	16.42	3.00	145.11
Distance to Admin. Border (km)	4,971	-0.17	4.06	-5.00	66.78
Distance to Village on Other Side (km)	4,971	8.28	6.11	0.24	29.97
Distance to Neighboring HQ (km)	835	88.35	158.75	0.47	1,081.75
Traveltime to HQ (in min)	1,098	702.33	986.21	0.00	10,036.79
Treatment Intensity	4,748	0.47	1.00	0.00	7.97
Urban	4,971	0.50	0.50	0	1
Distance to National Capital (km)	4,876	157.53	198.76	0.43	1,583.64
Distance to National Border	4,876	80.40	73.18	0.02	378.52
Distance to Coast (km)	4,971	390.27	371.59	0.05	1,204.80
Elevation	4,971	646.60	625.85	-1	2,766
Ruggedness	4,971	0.07	0.11	0.00	1.02
Malaria Suitability	4,971	11.47	11.58	0.00	35.71
Agricultural Suitability	4,175	0.38	0.20	0.00	0.99
Distance to Christian Missions (km)	4,971	55.67	111.99	0.16	742.50
Distance to Historical Cities (km)	4,971	417.44	370.35	0.0000	1,940.92
Distance to Colonial Railroad (km)	4,971	70.60	104.76	0.004	968.55
Admin. Unit Size (sqkm)	4,876	2,858.15	8,168.96	2.22	175,770.30
Chief Z-score	754	-0.28	0.75	-2.60	2.92
Chief Influence	171	-0.13	0.96	-2.09	2.12
Trust in Chief	579	-0.35	1.06	-2.82	1.70
Corrupt Chief (Inverse)	579	-0.25	1.03	-3.94	1.93
Contact with Chief	754	-0.28	0.90	-1.03	4.16
State Capacity Index	4,971	0.00	1.00	-2.96	3.02
Percentage of HH with Electricity	3,842	0.46	0.40	0.00	1.00
Percentage of Children Registered	2,809	0.51	0.33	0.00	1.00
Average Time to Water (min)	3,757	16.81	17.66	0.00	255.62
Literacy	3,088	0.56	0.31	0.00	1.00
Wealth Index	3,686	3.51	1.09	1.00	5.00
Infant Mortality	3,148	0.13	0.07	0.00	0.52
Traditional Medicine	3,265	-0.01	0.97	-0.28	9.74
Percentage of Kids Gone	3,148	0.24	0.11	0.00	0.75
Percentage of Men Born in Location	1,766	0.99	0.04	0.60	1.00
Percentage of Women Born in Location	1,759	0.98	0.04	0.55	1.00

Notes: This table shows the summary statistic of the regression sample. Only villages within 5km of an administrative border, and which have a village on the other side of the border, are included. Villages farther than 150km from their headquarter are dropped as are those where the neighboring village is more than 30 kilometers away. The sample for the DHS and Afrobarometer are pooled. Separate summary statistics can be found in the Online Appendix (Tables B1-B2).



# Migration

Table A3: Effect of Treatment on Migration

	<i>Dependent variable:</i>			
	Children	Men	Women	Z-score
	(1)	(2)	(3)	(4)
Low State Presence Treatment	0.017 (0.025)	-0.049 (0.053)	-0.016 (0.040)	-0.035 (0.023)
Treatment X Institutionalized	0.011 (0.056)	0.054 (0.066)	-0.022 (0.069)	0.030 (0.039)
Fixed effects?	Yes	Yes	Yes	Yes
Cluster	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit
Observations	2,650	1,398	1,467	2,697
Adjusted R <sup>2</sup>	0.316	0.130	0.204	0.571

Clustered standard errors in parentheses

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Notes: This table shows the results of OLS regressions with various measures of migration as outcomes. Following the main specification, the treatment variable is the intensive measure of how much the distance to the administrative headquarter is larger than on the other side of the internal administrative border while controlling for the distance to the administrative headquarter and its interaction with treatment variable. The sample is restricted to respondents who live within 5km of the internal administrative boundary. In order to only compare respondents in neighboring districts, border region fixed effects are included. Standard errors are clustered at the district level. The following dependent variables from the DHS survey are used: Column(1): Percentage of children that do not live at home. Column(2): Percentage of men that have always lived in their current location. Column(3): Percentage of women that have always lived in their current location. Column(4): Z-score combination of the three measures.

## Geographic Outcomes

Table A4: Effect of Treatment on Historical and Geographical Controls using Afrobarometer and DHS Data

	<i>Dependent variable:</i>									
	Dist Capital	Dist Nat Border	Dist Coast	Elevation	Ruggedness	Agriculture	Hist Cities	Malaria	Missions	Dist Rail
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Low State Presence Treatment	0.001 (0.003)	0.027** (0.012)	0.001 (0.003)	0.003 (0.025)	0.136 (0.145)	0.042 (0.041)	0.004 (0.003)	0.091 (0.073)	0.004 (0.006)	0.018*** (0.007)
Treatment X Institutionalized	0.010 (0.006)	-0.016 (0.031)	0.005 (0.006)	-0.015 (0.042)	-0.091 (0.230)	-0.037 (0.075)	0.005 (0.006)	-0.050 (0.079)	-0.014 (0.014)	0.008 (0.013)
Fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Admin Unit	Admin Unit	Admin Unit	Admin Unit	Admin Unit	Admin Unit	Admin Unit	Admin Unit	Admin Unit	Admin Unit
Observations	3,866	3,866	3,866	3,866	3,866	3,866	3,866	3,866	3,866	3,866
Adjusted R <sup>2</sup>	0.999	0.994	1.000	0.984	0.639	0.928	1.000	0.961	0.998	0.997

Clustered Standard errors in parentheses

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Notes: This table shows the results of OLS regressions with various geographical and historical variables as dependent variables. Following the main specification, the treatment variable is the intensive measure of how much the distance to the administrative headquarter is larger than on the other side of the internal administrative border while controlling for the distance to the administrative headquarter and its interaction with treatment variable. The sample is restricted to respondents who live within 5km of the internal administrative boundary. In order to only compare respondents in neighboring districts, border region fixed effects are included. Standard errors are clustered at the district level. The following dependent variables are used: Column(1): Distance to the Capital. Column(2): Distance to the National Border. Column(3): Distance to the Coast. Column(4): Elevation. Column(5): Ruggedness. Column(6): Land Suitability for Agriculture. Column(7): Distance to Historical Cities. Column(8): Malaria Ecology Index. Column(9): Distance to Catholic and Protestant mission stations. Column(10): Distance to Railroads in 1960.

## Robustness Checks

Table A5: Robustness: Different Measures of Institutional Context

	<i>Dependent variable:</i>		
	Chief Z-Score		
	(1)	(2)	(3)
Low State Presence Treatment	0.194*** (0.066)	0.189*** (0.066)	0.190*** (0.061)
Treatment X Institutionalized	-0.279*** (0.077)		
Treatment X Mentioned		-0.272*** (0.077)	
Treatment X Protected			-0.285*** (0.073)
Fixed effects?	Yes	Yes	Yes
Cluster	Admin. Unit	Admin. Unit	Admin. Unit
Observations	635	635	635
Adjusted R <sup>2</sup>	0.598	0.594	0.600
Clustered standard errors in parentheses		*p<0.1; **p<0.05; ***p<0.01	

Notes: This table shows the results of the same specification as Table 3 in Column (1). Additionally, instead of noting whether chiefs are institutionalized in the constitution, it interacts treatment with Baldwin (2016) measure of whether chiefs are mentioned in the constitution (Column 2) or protected in the constitution (Column 3). Table B3 and B4 in the Online Appendix show the results for these measures when subsetting the data by institutional linkage instead of the interaction. The results closely mirror those of the previous table.

Table A6: Covariate Balance — Country-Level Variables

Covariates (country level)	Not Institutionalized		Institutionalized		p-value
	N	Mean	N	Mean	
Historical Centralization	14	0.77	9	0.81	0.62
Year of Independence	14	1953.64	9	1961.56	0.48
Violent Independence?	14	0.21	9	0.33	0.56
Slave Exports	14	384400.07	9	204491.85	0.44
Population in 1400	14	1103483.21	9	456059.78	0.13
Log Settler Mortality	13	6.06	4	5.26	0.43
British Colony	14	0.21	9	1.00	0.00
British Legal Origins	14	0.29	9	1.00	0.00
Settler Colony	14	0.14	9	0.44	0.16
Colonial Railroads (km)	14	1019.29	9	1126.10	0.78
Gemstones	14	1583.93	9	48910.22	0.10
Soil Quality	14	39.20	9	29.41	0.26
Average Distance to Coast	14	17.52	9	11.94	0.49
Land area (1000 Ha)	14	55019.07	9	48056.33	0.69
Ruggedness	14	0.51	9	0.81	0.18
Oil Production in 2000	14	8501.92	9	74.09	0.31
Malaria Suitability	14	15.38	9	8.93	0.08
Rule of Law	14	-0.86	9	-0.35	0.05
GDP 1950	14	780.64	9	1021.56	0.40
Failed State Index 2006	13	85.98	9	80.36	0.43
Taxes as % of GDP 2010	14	13.28	8	16.87	0.22
Democracy Index 2017	14	4.96	9	5.79	0.17

Notes: Difference in means between countries where traditional leaders are institutionalized and where they are not. All reported p-values are from two-sided t-tests.

Table A7: Robustness: Interaction with Country Variables

	<i>Dependent variable:</i>								
	Pop. 1400	Brit. Colony	Brit. Legal	Settler Colony	Chief Z-Score Gemstones	Ruggedness	Malaria Suit.	Dem. Index	Q Rule of Law
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Low Local State Presence	0.141*** (0.051)	0.127*** (0.040)	0.120*** (0.039)	0.151*** (0.048)	0.127** (0.057)	0.104** (0.051)	0.109* (0.062)	0.143*** (0.051)	0.118* (0.061)
Treatment X Institutionalized	-0.202*** (0.065)	-0.177*** (0.058)	-0.164*** (0.056)	-0.183*** (0.063)	-0.159*** (0.059)	-0.145** (0.061)	-0.133 (0.086)	-0.202*** (0.060)	-0.175*** (0.062)
Treatment X CountryVariable	0.024 (0.043)	-0.022 (0.042)	-0.033 (0.040)	-0.049* (0.029)	-0.029 (0.044)	-0.081** (0.040)	0.071 (0.055)	-0.009 (0.022)	-0.042 (0.046)
Fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit
Observations	635	635	635	635	635	635	635	635	635
Adjusted R <sup>2</sup>	0.596	0.596	0.596	0.598	0.603	0.602	0.600	0.596	0.597

Clustered s.e. in parentheses

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Notes: This table shows the results of the main specification but also includes the interaction of treatment with several country-level variables to control for possible confounding factors. This results in the following specification:  $Y_{i,s,r} = \beta_0 + \beta_1 Tint_s + \beta_2 DB_i + \beta_3 T_s \times DB_i + \beta_4 Tint_s \times Institutionalized + \beta_5 DB_i \times Institutionalized + \beta_6 T_s \times DB_i \times Institutionalized + \beta_7 Tint_s \times CountryVariable + \beta_8 DB_i \times CountryVariable + \beta_9 T_s \times DB_i \times CountryVariable + \beta_{10} \chi_i + \beta_{11} BR_r + \epsilon$ . Border region fixed effects are included, and standard errors are clustered at the administrative unit level.

Table A8: Robustness: Different Specifications

	<i>Dependent variable:</i>					
	Main	No Controls	Binary Treatment	No Scaling	Long/Lat	Cluster
	(1)	(2)	(3)	(4)	(5)	(6)
Low State Presence Treatment	0.194*** (0.066)	0.109** (0.052)	0.311 (0.225)	0.184*** (0.064)	0.112* (0.058)	0.194** (0.081)
Treatment X Institutionalized	-0.279*** (0.077)	-0.149** (0.063)	-0.534* (0.284)	-0.244*** (0.083)	-0.132** (0.066)	-0.279*** (0.091)
Fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit
Observations	635	733	635	635	635	635
Adjusted R <sup>2</sup>	0.598	0.594	0.595	0.596	0.592	0.598

Clustered standard errors in parentheses

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

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Notes: This table shows the results of the same specification as Table 3 for Column (1). Column (2) does not include geographical controls. Column (3) uses only the binary treatment indicator. Column (4) does not scale the treatment variable by the country and administrative division specific coefficient of distance to the administrative headquarter on state capacity outcomes. Column (5) uses a polynomial specification of longitude and latitude similar to Dell (2010) ( $Y = \beta_1 Tint + \beta_2 long + \beta_3 lat + \beta_4 long^2 + \beta_5 lat^2 + \beta_6 long * lat + \beta_7 BR + \epsilon$ ). Column (6) clusters at the highest administrative division.

Table A9: Robustness: Different Measurement

	<i>Dependent variable:</i>					
	Chief Z-Score					
	Main (1)	Drop 100km (2)	Drop 50km (3)	No Restriction (4)	Non-Logged (5)	Traveltime (6)
Low State Presence Treatment	0.194*** (0.066)	0.239** (0.097)	0.262*** (0.100)	0.174*** (0.049)	0.144** (0.061)	0.116 (0.083)
Treatment X Institutionalized	-0.279*** (0.077)	-0.307*** (0.107)	-0.350*** (0.126)	-0.250*** (0.061)	-0.243*** (0.069)	-0.206** (0.092)
Fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit
Observations	635	627	592	712	635	619
Adjusted R <sup>2</sup>	0.598	0.604	0.602	0.599	0.598	0.598

Clustered standard errors in parentheses

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

Notes: This table shows the results of the same specification as Table 3 for Column (1). Column (2) drops outliers farther than 100km away from their administrative headquarter. Column (3) drops observations more than 50km away. Column (4) includes observations that do not have an observation on the other side of the border within 30km. Column (5) uses non-logged distance. Column (6) uses travel time to the administrative headquarter instead of straight distance.

Table A10: Robustness: Headquarters and Boundaries

	<i>Dependent variable:</i>							
	Main	Neighbor HQ	Admin 1	Admin 2	Chief Z-Score Donut RD	Ethnicity FE	Instrumented HQs	Placebo
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Low State Presence Treatment	0.194*** (0.066)	0.215** (0.092)	0.190*** (0.068)	0.120 (0.126)	0.080 (0.065)	0.193*** (0.073)	0.145** (0.064)	0.094 (0.067)
Treatment X Institutionalized	-0.279*** (0.077)	-0.300*** (0.114)	-0.294*** (0.089)	-0.175 (0.141)	-0.156* (0.087)	-0.272*** (0.084)	-0.133* (0.075)	-0.114 (0.084)
Fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit	Admin. Unit
Observations	635	490	357	278	506	634	658	663
Adjusted R <sup>2</sup>	0.598	0.543	0.589	0.613	0.584	0.597	0.583	0.593

Clustered standard errors in parentheses

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

Notes: This table shows the results of the same specification as Table 3 for Column (1). Column (2) controls for an observation's distance to the neighboring headquarter. Column (3) only uses the first administrative division in each country. Column (4) only uses the second administrative division in a country. Column (5) includes fixed effects for each ethnic homeland based on Murdoch maps. Column (6) uses instrumented locations for the administrative headquarters by taking the most populated location in an administrative division in 1960. Column (7) shows the effect of distance to "placebo" headquarters. The location of a district's capital is randomly determined.