Essays on State Building and Economic Development

Essays on State Building and Economic Development

A dissertation presented

by

Soeren J. Henn

to

The Department of Political Economy and Government

in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy
in the subject of
Political Economy and Government

Harvard University
Cambridge, Massachusetts

May 2019

Dissertation Advisor: Torben Iversen & Nathan Nunn Soeren J. Henn

Essays on State Building and Economic Development

Abstract

State building signifies a crucial challenge for economic development. Many states in the developing world lack sufficient capacity to adequately govern their territory, provide services, and promote economic growth. An increasing number of the world's most vulnerable and poor people live in so-called "fragile" or "weak" states. Improving the political and economic prospects of these populations requires an understanding of what shapes and hinders the state building process in these environments and how it might be improved.

In my dissertation, I explore the characteristics and impacts of state building in fragile and weak states, a setting where empirical evidence is scarce and existing theories offer competing hypotheses. Informed by fieldwork and qualitative interviews, I combine large and novel datasets with a variety of methods to identify causal relationships. Throughout my dissertation I study the consequences of state building on local power dynamics involving non-state actors, state agents, and citizens and evaluate ways in which our knowledge of these processes can help us improve state building. Specifically, my dissertation studies i) how state building affects the power, legitimacy, and effectiveness of village chiefs in Sub-Saharan Africa, ii) how rulers chose whether to govern territory via pre-existing institutions or establish their own governing structures and iii) what constraints state capacity investments and whether a top-down intervention may improve state building.

Contents

Acknowledgments

This dissertation would not have been possible without the support of many individuals at Harvard and beyond that made the Ph.D. the unique experience it was.

First of all, I would like to thank my dissertation committee: my two co-chairs Torben Iversen and Nathan Nunn as well as Horracio Larreguy and Pia Raffler. They were tremendous mentors. They never got tired of reading my work and providing comments and feedback. They always had an open door and two open ears, and were always there for me when I needed help, guidance, or advice. I have learned a lot from them. Without them, I would not be the scholar that I am today, and I honestly hope that scholar shares as many qualities with them as possible.

Over the years I have received feedback and advice from numerous professors at Harvard, especially in the Development (Emily Breza, Melissa Dell, Michael Kraemer, Asim Khwaja, Gautam Rao) and Political Economy (Alberto Alesina, Robert Bates, Filipe Campante, Jeff Frieden, Dustin Tingley) groups. Everyone at Harvard was extremely generous in offering their time and expertise. I also had the pleasure of teaching with great scholars, most notably Ken Shepsle who was a great mentor and role model.

During graduate school I was fortunate to work with many fantastic co-authors: Nahomi Ichino, Gauthier Marchais, John Marshall, Laura Paler, Sahar Parsa, Wilson Prichard, Pablo Querubin, James Robinson, Cyrus Samii, Raul Sanchez de la Sierra, and Carlos Schmidt-Padilla. I learned tremendously from all of them and working with them made me into the scholar I am.

I also want to thank the Marakuja family and all the Congolese researchers that worked

on my projects, especially Aimable Lameke and Christian Mastaki. Without them my research would not have been possible. Asante sana!

During my time at Harvard I received fantastic support by administrators at HKS, IQSS, the Government Department, and the Economics Department. Nicole Tateosian, Cassie McGrath, Thom Wall, and Brenda Piquet made sure that I could focus on studying/research/teaching and not worry about administrative things.

When I started my undergraduate studies at Essex, I would have never thought that they would eventually lead me to a PhD. Several individuals were instrumental in introducing me to academic research and encouraging me as a young scholar. Most notably my undergraduate advisor Anthony King remains my biggest role model in how to write, teach, and mentor. Without his support and advice as well as that from Alejandro Quiroz-Flores, Thomas Scotto, and Eric Smith I would have never been able to do a Ph.D. at Harvard.

Graduate school would not have been the same without my classmates and other students that helped me with problem sets (Thank you Pam), read my work, and made grad school fun. I am incredible lucky to have made so many outstanding friends: Josh Abel, Juan Galan, Hanno Hilbig, Connor Huff, Chris Lucas, Stephanie Majerowicz and Daniel Velez-Lopez.

Jonathan Homola might be the main reason why I ended up applying to grad school and instead of loosing sight of each other we managed to deepen our friendship while he was in St. Louis. That is also due to his amazing wife Michelle Torres. The two of them have given me feedback on countless papers and emails, provided emotional support, and shared many laughs in person or via telephone. I am truly fortunate to have them on my team. Of course I will always remember the Ph.D. as where I met Priya (in math camp!) who turned into the best friend, study-partner, personal comedian, girlfriend and fiancé I could have ever hoped for. Thank you!

Lastly I want to thank my family, Heike, Joerg-Uwe, Stephan, and Fynn. Being far away from them is the most difficult thing about living in the US. Still, they find ways to enrich my life and make me happy. My intellectual development has been shaped from the

beginning by my parents and grandparents without which this dissertation would not exist. Danke!

Introduction

State building signifies a crucial challenge for economic development. Many states in the developing world lack sufficient capacity to adequately govern their territory, provide services, and promote economic growth. An increasing number of the world's most vulnerable and poor people live in so-called "fragile" or "weak" states. Improving the political and economic prospects of these populations requires an understanding of what shapes and hinders the state building process in these environments and how it might be improved.

In my dissertation, I explore the characteristics and impacts of state building in fragile and weak states, a setting where empirical evidence is scarce and existing theories offer competing hypotheses. Informed by fieldwork and qualitative interviews, I combine large and novel datasets with a variety of methods to identify causal relationships. Throughout my dissertation I study the consequences of state building on local power dynamics involving non-state actors, state agents, and citizens and evaluate ways in which our knowledge of these processes can help us improve state building. Specifically, my dissertation studies i) how state building affects the power, legitimacy, and effectiveness of village chiefs in Sub-Saharan Africa, ii) how rulers chose whether to govern territory via pre-existing institutions or establish their own governing structures and iii) what constraints state capacity investments and whether a top-down intervention may improve state building.

Chapter 1

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 chapter studies how local leaders and the national state interact.

I provide a conceptual framework wherein the ways in which the strength of the central state affects the power of traditional rulers is shaped by the existence or absence of institutional linkages between chiefs and the state. As the central state is trying to govern and implement policies across its territory, it has to decide whether or not to institutionally incorporate traditional leaders, who might have local authority and legitimacy, but could also appropriate rents. This choice fundamentally changes the relationship between the local state and chiefs. When the central state cooperates with the chiefs and integrates them into the formal apparatus, it makes chiefs more likely to be dependent on the local state for resources and legitimacy. In this scenario of complementarity, weak local state capacity will also lead to weak chiefs, as the latter have access to less resources from the state and are blamed for its shortcomings. However, when the central state does not institutionalize the chiefs, each act independently from the other. In this scenario of substitution, chiefs are more likely to be able to step in and gain influence when the state is locally weak. Thus, this chapter hypothesizes that the interaction between the local state and chiefs will depend on the institutional context: when both are institutionally linked, their influence will be complementary, and when they are institutionally separated, they act as substitutes.

Using geocoded data from 25 countries, I test these hypotheses by estimating the effect that the presence of the national state has on the power, legitimacy, and effectiveness of village chiefs in different institutional settings. 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).[1] 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. Villages on different sides of internal administrative boundaries should be fairly similar in terms of their characteristics, but they are in different administrative units and have different distances to their respective administrative capitals. 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 border.

Using Afrobarometer and DHS data I first show that distance to administrative headquarters does indeed reduce outcomes related to state presence. I then find that, in line with my conceptual framework, 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.

[1] I use the term *district* interchangeably with other administrative divisions found in various countries such as "commune" or "municipality."

Chapter 2

The first chapter of my dissertation reveals the far-reaching consequences of the state's decision whether or not to institutionalize traditional leaders. Yet, both theoretically and empirically, it abstracts from the potentially endogenous nature of that decision by looking at the national level decision via the constitution. Chapter 2 returns to that decision-making process and investigates when rulers want to govern via local leaders and when they decide to establish their own governing structures. Understanding this decision is crucial as it shapes the ability of rulers to develop administrative state capacity, establishes institutional settings that influence economic development, and changes the relationship between local leaders and the population.

Existing studies face several challenges when studying the causes and consequences institutional choices. First, episodes of direct and indirect rule are poorly documented, because few records from periods prior to incorporation into larger entities survived (if they existed at all). Second, a fundamental challenge with existing cross-country empirical work is that the number of recorded country level episodes of this institutional change is small, and experiences are very context-dependent. Therefore, it has proven difficult to systematically understand the sources, or impacts, of direct and indirect rule.

This chapter, coauthored with Gauthier Marchais and Raúl Sánchez de la Sierra, overcomes these challenges by focusing on the institutional choice of armed groups in the Democratic Republic of the Congo, henceforth DRC. Specifically, we consider whether armed groups establish their own governing structures or rule via the local traditional chief. Through original data collection we assembled a yearly panel data set on the institutions of rule created by violent actors in 106 villages of Nord Kivu, in the eastern DRC that have changed "regime" multiple times over the last 25 years. The data makes it possible to trace the evolution of the institutional arrangements created by armed groups when they govern new territory. The DRC is considered a "failed state," and the presence of armed groups who govern conquered villages provides a suitable environment to study the causes of indirect

and direct rule.

We first develop an approach to conceptualize direct and indirect rule in the data. Drawing on the trade-offs faced by armed groups, the panel dataset we collected, as well as 600 pages of qualitative fieldwork we gathered through local researchers, we establish that the type of administration that armed groups create in their territories varies starkly along multiple dimensions.

We find that armed groups are more likely to implement indirect rule when the chief has better "technology" compared to the group. Chiefs who share ethnic ties with the population to be governed are more likely to be requested to take on roles of indirect rule for the armed group than chiefs who do not. Armed groups who share ethnicity with the population, in turn, are more likely to provide public services for the village themselves.

Furthermore, the decision to co-opt traditional chiefs is not constant over time: the longer an armed group is in power, the more likely they are to develop direct rule. This effect comes mostly by taking over the roles of taxation, administration, and justice in the village.

Finally, we examine the impact of indirect rule on the subsequent ability of traditional chiefs to rule. Since indirect rule usually pushes the chiefs beyond their "optimal" level of extraction constrained by the need to sustain their own legitimacy and accountability, traditional chiefs' ability to rule can be eroded by episodes of indirect rule. We measure detailed characteristics of chiefs, and the population attitudes towards different chiefs after the episode took place, using surveys and implicit association tests. We find no evidence that exposure to indirect rule creates resentment among the population, nor undermines the traditional chiefs' ability to govern.

Chapter 3

While the previous chapters looked at the state's decision to work with local leaders, what happens when the state decides to do establish it's own governing structure? What constraints local governments to invest in state capacity and how can the state incentive it's

local state apparatus to improve state capacity and local public good provision? In the third chapter Horacio Larreguy and John Marshall and I investigate a more top-down attempt to improve state building in Mexico on a larger scale.

While much of the extant literature has focused on the initial impetus for developing state capacity, we focus on a common contemporary challenge: how can higher levels of government induce local governments to increase their state capacity and public good provision? We examine this question in the context of the implementation of Mexico's *From the Local Agenda* (Agenda desde lo Local, ADL) program. The ADL program was first implemented by the federal government in 2004, in collaboration with state governments, following the United Nations Local Agenda 21—an action plan to promote sustainable development by strengthening the institutional capacity of local governments. The ADL program consists of four main stages: (1) self-diagnosis by municipal government officials across 39 indicators of state capacity, which can be designated a red, yellow, or green status; (2) third-party verification of this status by a local institution of higher education, which results in the municipality receiving a certificate for achieving the highest grade on any given indicator; (3) improvement in opportunity areas by municipal government officials; and (4) updated self-diagnosis and third-party verification, again resulting in the granting of certificates for each new indicator that receives the highest grade in the municipality.

We examine the effect of entering the ADL certification program on levels of municipal state capacity using a generalized difference-in-differences design to leverage temporal variation in take-up of the ADL program. To avoid comparing municipalities that took up the ADL program with those that never did it, we focus only on the sample of municipalities that ever decided to participate in the program. We further exploit differences in the baseline certification upon entry into the program in order to focus on the effects in municipalities with low initial levels of state capacity—the program's primary targets. Were the program to operate entirely as hoped, we should expect to observe the greatest increases in state capacity in such municipalities.

We theorize that effect of a federal and state certification program on policy outcomes in a

given location is ambiguous. We consider an adverse selection, two-period model where there are two types of municipal politicians: honest and corrupt. Both types care about rents from holding office, but only the former shares the voters' preferences and only the latter enjoy funds appropriated from the public treasury. In both periods, municipal incumbents can allocate the budget either entirely into current public service delivery, or partly into currently public service delivery and partly into state-capacity investments, or into fund appropriation. While state-capacity investments entail a lower current public service delivery, they lead to a more efficient future public service delivery. We consider the case where these investments are socially desirable. Voters decide whether to reelect the incumbent in between periods. While voters can observe if the budget was spent entirely on current public service delivery, they cannot distinguish whether the incumbent has appropriated the budget funds from whether they made state-capacity investments.

We show that, absent the certification program, when the possibility of a corrupt incumbent is too high, investments in state capacity are not feasible since when voters do not see the budget being spent entirely on current service delivery, they are more likely to think that they have a corrupt incumbent that has appropriated the budget funds, and thus to elect a challenger candidate.

We then formalize the certification program, which is conceived as a third party that states how the budget has been spent. Third parties, however, can be corruptible with certain probability. The program is implemented by federal and state governments, but also needs to be adopted by each municipal government incumbent. We show that, while program implementation has an overall positive effect on voter welfare, it has important redistributive consequences across adopting municipalities.

The results are largely in line with the empirical predictions of our theory. First, we observe increased certification in municipalities politically aligned with the state government, which validates our use of such an alignment as a proxy for the likelihood that a certifying third-party is corrupt. Second, we find no discernible effect of certification on overall public service delivery on average, which is consistent with a high fractions of corrupt certifying

third parties and municipal incumbents. Third, the results indicate that certification led to overall lower public service delivery in municipalities aligned with state government, and where baseline certification levels were low.

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

1.1 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).[1] 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 1.1 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 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

[1] I use the term *district* interchangeably with other administrative divisions found in various countries such as "commune" or "municipality."

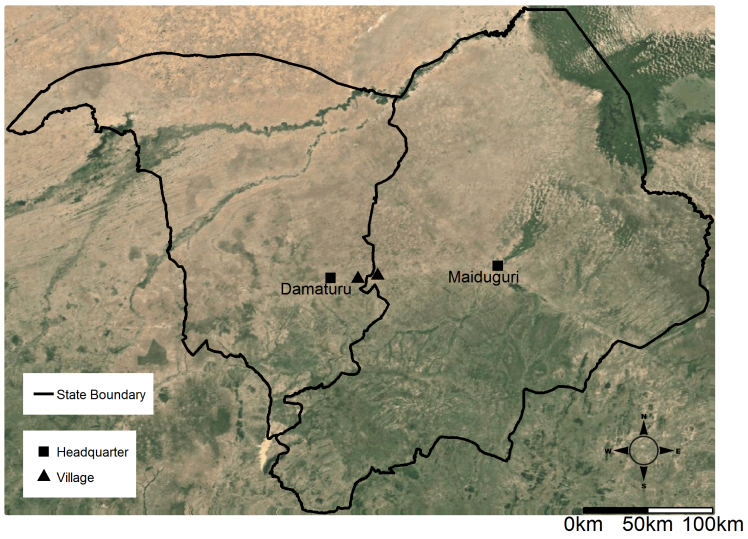


Figure 1.1: Illustration of Identification

Notes: 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.

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 Kolesar (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 endogenity 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 (Lowes 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 1.2, I give some background on state presence and traditional leaders in Africa and what empirical implications can be drawn from it. Section 1.3 explains the empirical strategy and validates distance as a measure of state presence. Section 1.4 presents the data, and Section 1.5 gives the results. Section 1.6 shows robustness. Section 1.7 discusses the implications of the findings for our understanding of the chief-state relationship at the country level, and Section 1.8 offers concluding remarks.

1.2 Background and Empirical Implications

1.2.1 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).[2] 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

[2]For a similar definition, see (Holzinger, Kern, and Kromrey 2016).

had little historical origin and were simply invented (Ranger 1983).[3] 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 2017; Gottlieb 2017; Tsai 2007).[4] 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,

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

[4]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.

chiefs can convince the population to contribute labor to public construction works such as schools or boreholes (Baldwin 2016; Voors et al. 2017).[5] 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).[6]

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.

1.2.2 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 2014). Third, the relationship between the central state and its local bureaucrats

[5]Examples of public goods provided by traditional leaders can be found in Figure A.1, which shows pictures from villages in the DRC.

[6]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).

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.[7] Section 1.3 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.

1.2.3 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

[7] 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 1.3.

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 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 posses 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).[8]

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

[8]Previous research has also identified democracy, colonial background, economic resources, state capacity, and decentralization as factors determining this decision. Section 1.6 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.

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.

1.2.4 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.[9] 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,

[9] e.g. Qualitative Interview P2, July 2017, South Kivu Province, DRC and L18, July 2018, North Kivu province, DRC.

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.[10] 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 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*

[10] e.g. Qualitative Interview P4 and P6, July 2017, South Kivu Province, DRC.

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 mainte-

nance, constructions, local justice provision), but not ones that are regional or specialized (e.g. providing health care).

1.3 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.

1.3.1 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.[11] 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.

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 1.1 shows the OLS results of regressing log distance to the appropriate administrative headquarters on

[11] 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)).

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 1.1 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 1.2 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.

1.3.2 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

Table 1.1: Effect of Log Distance to HQ on Outcomes Related to State Presence

Panel A: Afrobarometer Data	*Dependent variable:*			
	Taxes paid	Local Dev	Public Goods	State Presence Index
	(1)	(2)	(3)	(4)
Log Distance to HQ	−0.153***	−0.206***	−0.094***	−0.150***
	(0.030)	(0.015)	(0.016)	(0.013)
Observations	3,346	15,524	15,544	15,544
Adjusted R^2	0.221	0.605	0.333	0.481
Panel B: DHS Data	*Dependent variable:*			
	Registered	Electricity	Piped Water	State Presence Index
	(1)	(2)	(3)	(4)
Log Distance to HQ	−0.128***	−0.311***	−0.261***	−0.216***
	(0.009)	(0.012)	(0.014)	(0.008)
Observations	28,814	30,239	30,239	30,239
Adjusted R^2	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 1.4. 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.

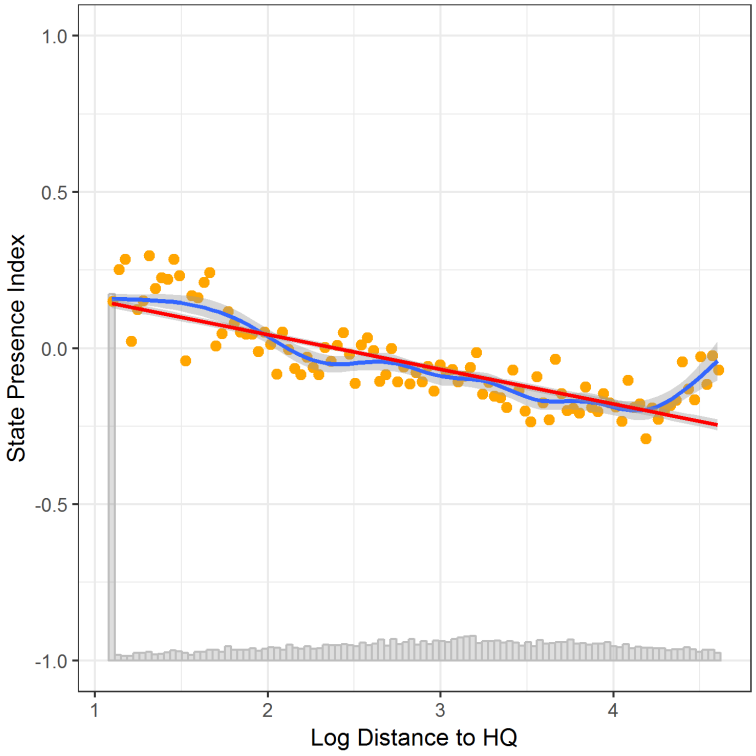


Figure 1.2: Bin-scatter between state presence and distance

Notes: This figure shows 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. This figure shows the Afrobarometer. Figure A.2 in the Appendix offers alternative ways to represent the data and results using the DHS data.

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 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 sites of administrative boundaries within a country. While people, goods, and services move freely across these administrative borders, government officials, tasked with administrating 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.[12]

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.[13] In Section 1.6, I show that the exact choice of bandwidth does not drive the results by replicating the

[12]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.

[13]Also note that these fixed effects will control for all country level variation.

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.[14] In Section 1.6 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 distance to the border as well as the interaction of that distance with the treatment variable.

1.3.3 Main specification

The identification strategy leads to the following main specification:

$$Y_{v,s,r} = \beta_0 + \beta_1 Tint_s + \beta_2 DB_v + \beta_3 T_s \times DB_v + \beta_4 \chi_v + \beta_5 BR_r + \epsilon_{v,s,r} \qquad (1.1)$$

[14] Using the logged distance takes into account the relative change across the two sides. I also show robustness using the non-logged distance.

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;[15] 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; χ_v is a vector of geographical and historical controls for village v which are pre-treatment;[16] 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 β_1. It signifies the jump at the border, after β_2 and β_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 1.3 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.[17]

[15] Note that it is inversed when treatment is 0.

[16] I also show robustness to leaving out these control variables.

[17] 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 1.6.

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. 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 1.6, 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.

1.4 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.

1.4.1 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

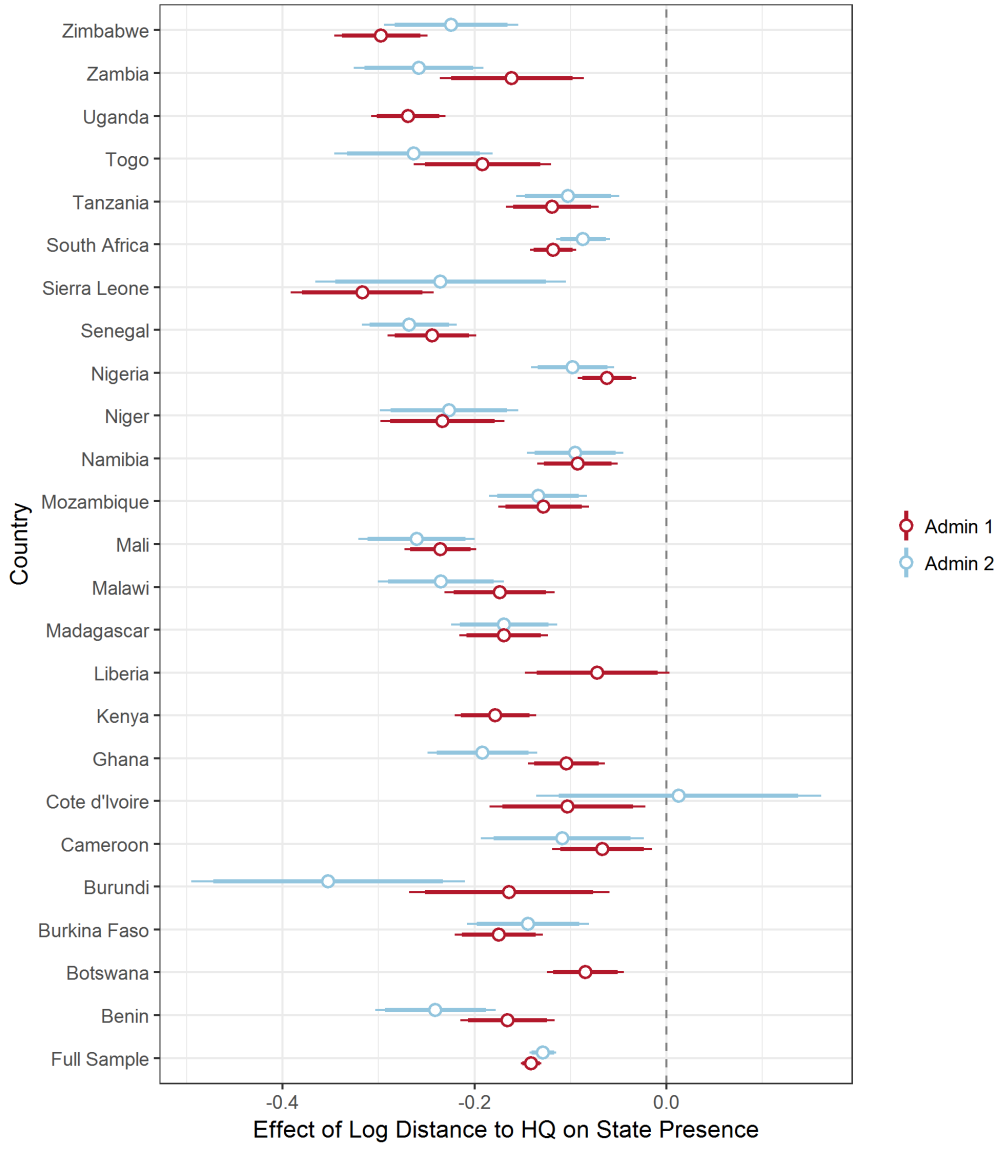


Figure 1.3: Correlation between state presence and distance by country and administrative division

Notes: 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 1.1, 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.

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).[18]

1.4.2 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.[19]

1.4.3 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.[20] The sample is visualized in Figure 1.4. First, I identified which 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 head-

[18] I further restrict my sample to the respondents geo-coded at the town/village level, as opposed to the 'district' level.

[19] 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.

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

quarters 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.[21] 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 A.1 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 A.3 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.

1.4.4 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 1.3 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.

[21] Cross-referencing my data with Grossman and Lewis (2014) suggests high levels of accuracy.

1.4.5 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 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.

1.4.6 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.[22] 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. Figure 1.5 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.

[22] https://www.constituteproject.org

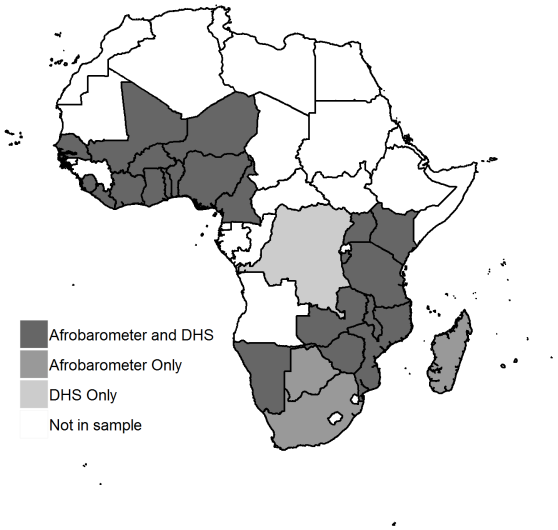


Figure 1.4: Map of Countries in the Sample

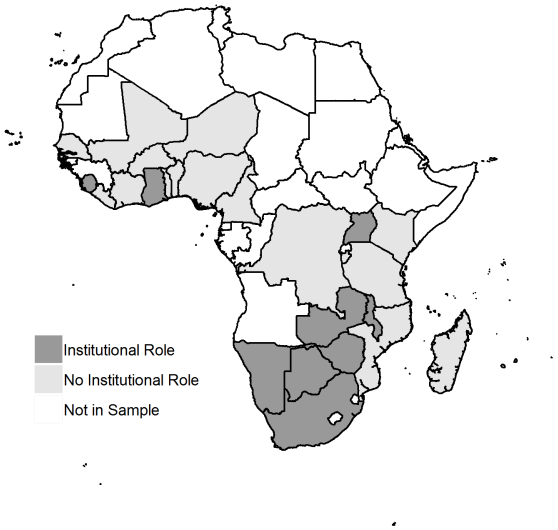


Figure 1.5: Map of Institutional Variation

1.4.7 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 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.

1.4.8 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.

1.4.9 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 A.2 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.

1.5 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 1.2 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.

Table 1.2: Effect of Treatment on State Presence Index

	Dependent variable:	
	State Presence Index	
	Afrobarometer	DHS
	(1)	(2)
Low State Presence Treatment	-0.115^{**}	-0.085^{***}
	(0.051)	(0.019)
Fixed effects?	Yes	Yes
Cluster	Admin. Unit	Admin. Unit
Observations	936	2,930
Adjusted R^2	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.

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 1.3). This is not surprising considering that the Afrobarometer sample contains countries with very distinct institutional setups and thus different state-chief relationships.

Next, Table 1.3 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 interaction 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 1.3: Effect of State Presence on Chief Power

	Dependent variable:			
	Chief Z-Score			
	Pooled Sample	Pooled Sample	Not Institutionalized	Institutionalized
	(1)	(2)	(3)	(4)
Low State Presence Treatment	−0.022	0.194***	0.176***	−0.094**
	(0.037)	(0.066)	(0.066)	(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^2	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 1.4: Effect of State Presence on Components of Chief Z-Score

	Dependent variable:				
	Chief Z-Score	Influence of Chief	Contact with Chief	Trust in Chief	Chief not Corrupt
	(1)	(2)	(3)	(4)	(5)
Low State Presence Treatment	0.194***	0.411***	0.216**	0.086	0.226***
	(0.066)	(0.112)	(0.096)	(0.087)	(0.081)
Treatment X Institutionalized	−0.279***	−0.827***	−0.252**	−0.098	−0.240**
	(0.077)	(0.264)	(0.106)	(0.100)	(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^2	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 1.3. 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).

Table 1.4 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. A.5 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.

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 1.5 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.[23] By allocating land, administrating 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

[23]Qualitative Interview L5 and L6, May 2018, North Kivu province, DRC.

a comparative advantage.[24] 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 1.5 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.

1.6 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.

[24] Qualitative Interview L2, July 2018, North Kivu province, DRC.

Table 1.5: Effect of State Presence on Public Good Outcomes

	Dependent variable:			
	Literacy	Wealth	Infant Mortality	Trad. Medicine
	(1)	(2)	(3)	(4)
Low State Presence Treatment	-0.028^{**}	-0.076^{***}	0.035	0.047
	(0.012)	(0.022)	(0.026)	(0.032)
Treatment X Institutionalized	-0.057^{**}	-0.121^{***}	-0.102^{**}	-0.104^{**}
	(0.027)	(0.040)	(0.051)	(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^2	0.816	0.711	0.416	0.211

Clustered standard errors in parentheses *p<0.1; **p<0.05; ***p<0.01

Notes: 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).

1.6.1 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 A.6 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[25] between where traditional leaders are institutionalized from when traditional leaders are not 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. The results are

[25]Note that the sample size is only 23 countries.

shown in Table A.7. Even when interacting treatment with these potential confounders, the interaction of treatment and institutionalization remains sizable, negative, and statistically significant.[26]

1.6.2 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 A.4 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).[27] Still, all variables in the table and their interaction with institutionalization of chiefs are included as controls in the main analysis.[28]

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 A.5. 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

[26] 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.

[27] Figure A.6 shows that dropping each country individually from the analysis does not affect the results.

[28] I also run the analysis without using controls in Column 2 of Table A.8, and the results remain consistent.

on either side of the border. Table A.3 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.

1.6.3 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.[29] 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 1.6. 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

[29] 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.

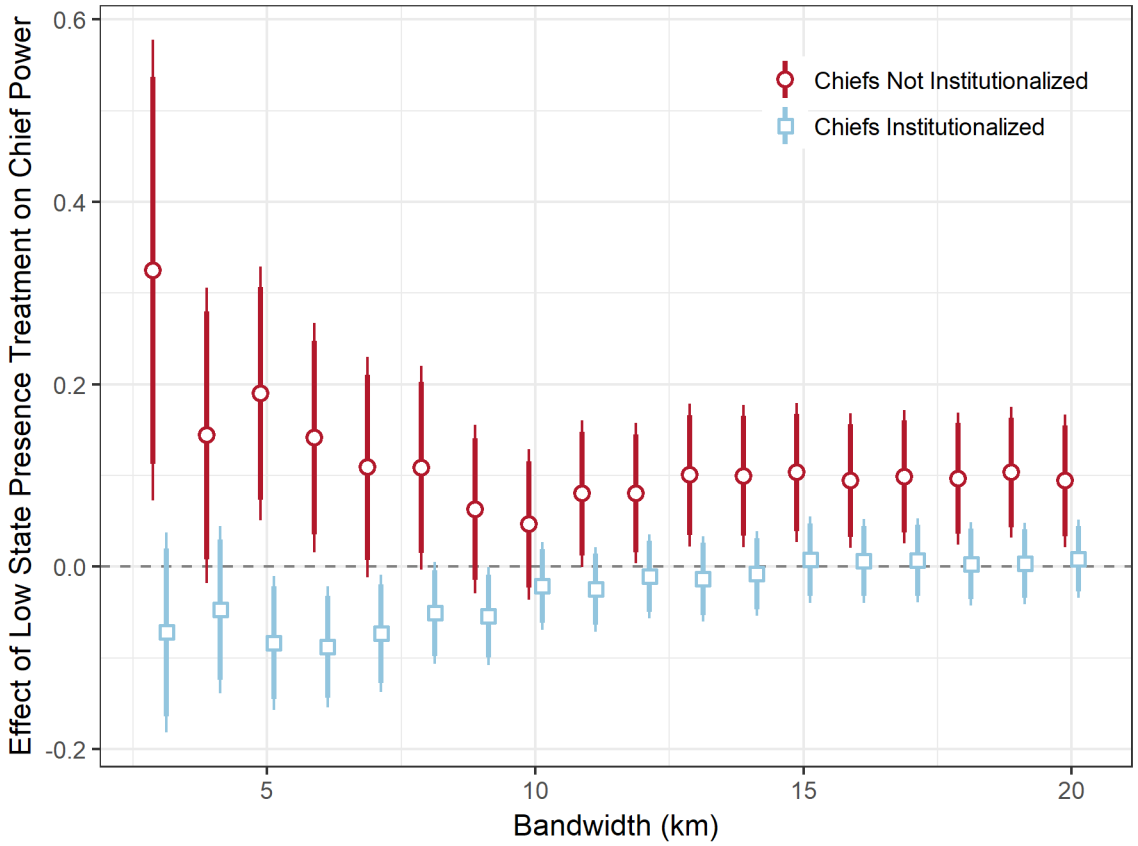


Figure 1.6: Changing the Bandwidth

Notes: This figure shows the effect of the treatment measure on the dependent variable of Table 1.3 using different bandwidths. 3-20 kilometers are used as bandwidths. The 95% and 90% confidence intervals are plotted for each bandwidth.

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 A.8 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 A.8 in the Appendix).

To ensure my choice of specification does not impact the results I run a Cubic Polynominal RD specification similar to Dell (2010) (Column (5) in Table A.8 in the Appendix). Furthermore, I also conservatively cluster the standard errors at the highest administrative division instead of the lowest (Column (6) in Table A.8 in the Appendix).

The specification could also be sensitive to the inclusion or exclusion of outliers, both in terms of extreme values of the explanatory variable as well as specific countries. To make sure the results affected, I drop extreme outliers that are more than 100 km and 50km away from the administrative headquarters in Columns (2) and (3) of Table A.9, respectively, in the Appendix. In Figure A.6 in the Appendix, I show the results dropping one country at a time. Columns (4) of Table A.9 does not restrict to border segments by also including villagers whose nearest village on the other side of the border is farther than 30km.

More generally, the results are also robust to different typical geographic regression discontinuity specification. 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 A.9. 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 A.9 in the Appendix).[30]

[30]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.

1.6.4 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 headquarter in the neighboring administrative unit (Column (2) in Table A.10 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 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 A.10 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 A.10 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 A.10 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 A.10 in the Appendix) and the low level of migration (Table A.2 and A.3) 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[31] 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 A.10 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 A.10 in the Appendix. Reassuringly, distance to these placebo headquarters does not result in sizable or significant effects, whether chiefs are institutionalized or not.

1.6.5 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 de la Sierra (2018) conducted Implicit Association Tests (IAT), a behavioral test to

[31] Earlier data on population density is not disaggregated enough.

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.[32] 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 1.6 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 1.6: Effect of State Presence on Role of Local Institutions in the DRC

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

Clustered standard errors in parentheses *p<0.1; **p<0.05; ***p<0.01

Notes: This table 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.

[32]Chiefs are mentioned in the constitution but are not assigned a formal role.

1.7 Implications of Findings

The findings from Section 1.5 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

Table 1.7: Empirical Implications

		Institutionalized Chiefs?	
		Yes	No
State Capacity	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

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 where not institutionalized, as the state saw them as incompatible with modernization and as an alternative 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 1.7 summarizes the empirical implications.

1.8 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.

2 | The Political Economy of Indirect Rule: Armed Groups in Eastern Congo

2.1 Introduction

Kings, states and empires conquering foreign populations need to have administrative state capacity in order to raise taxes, gather intelligence, and enforce property rights. Rulers can perform these functions either by creating their own administration, or by enlisting pre-existing local authorities to administer on their behalf, a practice known as indirect rule. These local leaders usually have more legitimacy and local information, but potentially different preferences than rulers over how governing functions should be implemented. Armed groups in civil wars face a similar trade-off. These choices have far reaching consequences. They shape the ability of rulers to develop administrative state capacity, they establish institutional settings that influence economic development, and they change the relationship between local leaders and the population.

There has been considerable academic attention on the institutional choice by rulers (Greif 2008; Boone 2003), the long-run consequences of these decisions (Mamdani 1996; Acemoglu et al. 2014), as well as more generally the forms of authority that emerge during armed conflict (Wood 2003; Kalyvas 2006; Mamphilly 2011; Arjona, Kasfir, and Mampilly 2017). However, existing studies face several challenges when studying the causes and consequences institutional choices. First, episodes of direct and indirect rule are poorly documented, because few records from periods prior to incorporation into larger entities survived (if they existed at all). Second, a fundamental challenge with existing cross-country empirical work is that the number of recorded country level episodes of this institutional change

is small, and experiences are very context-dependent. Therefore, it has proven difficult to systematically understand the sources, or impacts, of direct and indirect rule.

We overcome these challenges by focusing on the institutional choice of armed groups in the Democratic Republic of the Congo, henceforth DRC. Specifically, we consider whether armed groups establish their own governing structures or rule via the local traditional chief. Through original data collection we assembled a yearly panel data set on the institutions of rule created by violent actors in 106 villages of Nord Kivu, in the eastern DRC that have changed "regime" multiple times over the last 25 years. The data allow us to trace the evolution of the institutional arrangements created by armed groups when they govern new territory. The DRC is considered a "failed state," and the presence of armed groups who govern conquered villages provides a suitable environment to study the causes of indirect and direct rule.[1] In this paper, we examine 256 episodes of village governance created by armed groups and traditional chiefs over the past 25 years in 106 villages.[2]

We first develop an approach to conceptualize direct and indirect rule in the data. Drawing on the trade-offs faced by armed groups, the panel dataset we collected, as well as 600 pages of qualitative fieldwork we gathered through local researchers, we establish that the type of administration that armed groups create in their territories varies starkly along multiple dimensions.

We find that armed groups are more likely to implement indirect rule when the chief has better "technology" compared to the group. Chiefs who share ethnic ties with the population to be governed are more likely to be requested to take on roles of indirect rule for the armed group than chiefs who do not. Armed groups who share ethnicity with the population, in turn, are more likely to provide public services for the village themselves.

Furthermore, the decision to co-opt traditional chiefs is not constant over time: the

[1]Source: Fund For Peace (2013). Several authors have recently challenged the term failed state for the DRC. See Engelbert and Tull (2013) and Hoffmann (2014). See United Nations Security Council (2002), Nest (2011), Sanchez de la Sierra (2014) Stearns (2011), Verweijen (2013), the Usalama project. See also the RRMP program evaluation reports.

[2]For some variables, we also have additional 133 villages in South Kivu, totaling 508 episodes.

longer an armed group is in power, the more likely they are to develop direct rule. This effect comes mostly by taking over the roles of taxation, administration, and justice in the village.

Finally, we examine the impact of indirect rule on the subsequent ability of traditional chiefs to rule. Since indirect rule usually pushes the chiefs beyond their "optimal" level of extraction constrained by the need to sustain their own legitimacy and accountability, traditional chiefs' ability to rule can be eroded by episodes of indirect rule. We measure detailed characteristics of chiefs, and the population attitudes towards different chiefs after the episode took place, using surveys and implicit association tests. We find no evidence that exposure to indirect rule creates resentment among the population, nor undermines the traditional chiefs' ability to govern.

The outcome of our research has implications for research and policy on institutional choice. Local leaders, often traditional chiefs, can use a combination of mechanisms, rituals, and spiritual power to solve collective action problems, and thus improve public good provision and distribute resources in the presence of incomplete contracts (Flannery and Marcus 2012). Outside rulers and armed groups, whose source of power usually relies on coercion, are mostly unable to activate such mechanisms, and are thus usually limited to the incentive effects of coercion and threats of violence. Rulers of states and armed groups more generally, recognizing the legitimacy held by traditional chiefs, often try to exploit it by installing indirect rule and delegating local administrative duties such as collecting taxes, intelligence, mobilizing recruits and the provision of public goods. Indirect rule was also doctrine of rule over native populations in the colonial era. Recent research has shown that, even in empires that championed indirect rule as their central doctrine, modes of rule varied significantly Boone (2003). Indirect rule has been observed in cases where the conquering military actor is a full-fledged state with a political and administrative capacity that is independent (at least at the onset) from the conquered societies | for instance, the US invasion of Irak is often described as one such episode (Hechter and Kabiri 2010).[3] The mechanics of this

[3]Yet knowledge of the institutional origins of armed factions in conflict zones such as eastern DRC does

choice have been examined in economics theoretically, in Padró I Miquel and Yared (2012).

A growing literature across social sciences examines the formation of state capacity. Besley and Persson (2009) examine the origins of fiscal and legal capacity in Europe, and argue that state capacity is the outcome of a dynamic choice by rulers interested in extracting resources in the long run. However, state capacity is also the outcome of a balance of power between rulers, and the administrators, who have the power to implement policy | or refrain from doing so (Greif 2008). Rulers have historically confronted the problem of how to select, and how to manage administrators. When administrators have local power to mobilize resources locally, they can be a useful ally of the ruler, but by the same token they can also create most harm by refraining to implement their policy or by mobilizing forces against the ruler. Rulers have solved this problem by attempting to undermine the power of administrators vis a vis the ruler | with for instance, the creation of competition between administrators, rotations systems. A low-cost approach to build an administration that rulers often engaged with is to build alliances with local power-holders, who have local sources of legitimacy and power. These local power holders kept their populations under control and collected taxes, in exchange for the technology of coercion provided by the rulers "monopoly of violence." However, local power holders have little loyalty towards the central ruler and poor incentives to perform. They have thus often colluded among themselves and with the population against the ruler. Thus, rulers interested in extracting more resources, and especially with a longer time horizon, have historically created state capacity by "vertically integrating." Local rulers were replaced by agents of the central administration sent by the ruler, creating direct rule (Tilly 1990). While this latter form of governance is likely to increase the power of the ruler over the long run, it is also more costly to develop, and thus was not always the preferred strategy (Mamdani 1996).

A significant body of evidence points to the detrimental effects of indirect rule on develop-

not always warrant this assumption of "foreign political entities." In most contemporary conflicts, not some conquering and ruling entities are part of conquered entities from the outside. Indeed, many armed groups have deep social and institutional bases in the societies in which they emerged and evolve, and are a part of larger power networks that span political, economic and military spheres (Sanchez de la Sierra 2019).

ment, and in particular, the poorest segments of the population (Mamdani 1996; Acemoglu et al. 2014). Indirect rule often pins the chief against the population creating long-run animosity and conflict, reducing chief's ability to govern and solve coordination problems. The legitimacy of chiefs derives historically from their (natural and supernatural) capacity to provide goods (such as rain, agricultural produce, successful mine extraction, protection from thieves) and the ancestral justification to their power (Flannery and Marcus 2012). Their legitimacy crucially hinges on the reciprocal gift exchanges that the chief must sustain with their population. With indirect rule for an outside ruler who shares little ties and accountability with the population to be governed, this channel can be broken, as chiefs become accountable not to their communities, but to an external, usually extractive ruler. These external rulers (armed groups, colonial states) most often provide the coercive means to support to the chiefs efforts to maximize resource and labor extraction, beyond optimal "legitimate" levels that the traditional chiefs would have otherwise chosen given their initial accountability links.

The remainder of the paper is organized as follows. Section 2.2 provides background. Section 2.3 presents the conceptual approach. Section 2.4 presents the approach to data collection and the data. Section 2.5 examines the variation in rule in the data and introduces our measure of direct rule and indirect rule. Section 2.6 examines the determinants of direct rule, and of indirect rule. Section 2.7 presents the analysis of the impact of indirect rule. Finally, Section 2.8 concludes.

2.2 Background: governing foreign populations in Eastern Congo

Eastern DRC presents a varied "political topography" inherited from a complex institutional history. Pre-colonial Eastern Congo was characterized by decentralized political entities, in contrast to neighboring Rwanda where much more centralized forms of political organization prevailed (Chrétien 2000; Newbury 1992). Political authority was organized around lineage systems and small chiefdoms, but remained highly decentralized (Newbury

2009). Regional conquests in the 19th century, followed by the colonial era, introduced "extractive" forms of rule in the region, which relied heavily on local intermediaries, and particular chiefs, to mobilize resources. While in certain areas, the colonial state directly appropriated the means of production | land | it applied indirect rule in less lucrative areas or areas where it did not have sufficient administrative capacity. Those areas were integrated into the colonial state by organizing native populations into ethnic constituencies under the leadership of traditional chiefs, tasked with mobilizing resources-taxes and labor | and maintaining order (Hoffmann 2014; Mamdani 2012). After decolonization, the newly independent state maintained and reproduced the modes of governance that had been set up during the colonial era (Hoffmann 2014). As the post-colonial Mobutist state collapsed in the late 1990's, multiple actors, international business networks and various armed factions, attempted to assert territorial and political control over the resource rich East.

The Second Congo War (1998-2003) led to the creation of a large number of armed groups. In 1998, the Rassemblement Congolais pour la Démocratie (RCD) launched an offensive to overthrow the then DRC president in office, Laurent-Désiré Kabila. The RCD struggled to dominate the rural areas, where it faced resistance by the self-defense groups known as the Mayi-Mayi and by the Forces De Libération du Rwanda (FDLR) among other groups. More than thirty armed groups were active, mostly in the east of the country, and nine foreign armies intervened during the conflict. This conflict weakened the Congolese state and led to the implantation of a large number of armed groups and criminal networks, many of which persisted beyond the official end of the war in 2003. The Congolese state struggled to regain control over the Eastern Provinces in the "post-conflict" period (2003-2017). Despite the official end of the war, they remained affected by recurring armed conflict, with a succession of large scale rebellions (CNDP, M23), larger armed groups such as the Forces De Libération du Rwanda (FDLR) and myriads of local self defense groups fighting for control over territory and population in the rural areas. Today, armed groups control large areas of territory in the East. In some districts they control most of the administra-

tive divisions (Shabunda, Mwenga, Fizi, Walikale, Lubero, Beni, Masisi, and Rutshuru).[4] Between May 2012 and November 2013, a new armed group, the M23, established its own control of a large territory, and created their administration, which included a Ministry of the Interior, of Foreign Affairs, and of Agriculture. Armed groups systematically govern territory, it is thus no surprise that they are aware of the challenges to administer such territory: "When you wage war, when you occupy a territory, you have to administrate it, control it, and secure it" (Col. Sultani Makenga, M23).[5] To finance their operations, armed groups collect taxes on economic activity in the territory they control. To fill their ranks, armed groups frequently recruit civilians. To obtain intelligence, they regularly cooperate with well-connected civilians who share information.

Several authors have documented how armed factions deployed very similar modes of governance to those of the colonial and post-colonial state, relying on local authorities | in particular village chiefs | to mobilize resources and maintain a decentralized form of government (Morvan 2005; Hoffmann, Vlassenroot, and Marchais 2016). For example, the Mayi-Mayi Padiri, one of the largest factions of the second Congolese War, instituted a highly centralized administration, the "administration des forets", whereby village chiefs were tasked with collecting taxes and recruiting labor for the organization (Hoffmann 2014; Morvan 2005). Preparatory research carried out for this project suggests that numerous distinct armed factions also practice various forms of indirect rule, and that their practices vary in response to the opportunities they face in different areas. Table B.1 presents the type of governance arrangements by armed groups in 239 villages of North and South Kivu where we collected such data. Covering the years 1995 to 2012, the sample captured 508 episodes of armed group rule at the level of a village. The table shows that there is substantial variation in the type of institution chosen, both across and within groups. The FDLR is

[4] In Shabunda, the Raia-Mutombokis controlled 95% of the territory in 2012. See for instance http://radiookapi.net/actualite/2013/02/28/shabunda-la-milice-raia-mutomboki-occupe-95-du-territoire-selon-son-administrateur/.

[5] http://www.timesfreepress.com/news/local/story/2012/sep/22/congo-m23-rebels-accused-forming-parallel-governme/88678/

disproportionately more likely to create direct rule, the Congolese Army and the Mayi-Mayi's to create indirect rule, and the Raia Mutomboki to share power with traditional chiefs. Furthermore, across episodes but within armed group, all groups recorded both indirect rule, direct rule, and shared arrangements.

2.3 Conceptualizing the analysis of indirect rule

In this section, we present the conceptual framework for analyzing indirect rule. Before doing, so we begin with an example that crystalizes the trade-offs faced by rulers of armed groups governing foreign populations.

2.3.1 Motivating Example: Indirect rule by the Nduma Defense of Congo

The example of the Nduma Defense of Congo-Guidon crystalizes the essence of the argument.[6]

The region that came under control of the NDC, like many rural parts of eastern DRC, is marked by extremely difficult terrain. Establishing and maintaining military control over such areas is costly, which neither the colonial nor post-colonial state were able to achieve (Herbst, 2000). Thus, with limited financial, logistical, and military resources, the geographical allocation of military resources is a crucial strategic and financial imperative, and one which can determine the fate of a non-state rebel group. In turn, the distribution of these resources can affect the armed faction's administrative capacity, and, when armed group rule extends in time, have far reaching consequences in terms of political, economic and social trajectories of entities subjected to armed group rule.

Among the numerous reasons invoked by commanders and members of armed groups to explain the distribution of military means, military strategy and the need to mobilize

[6]This example draws extensively on work conducted for Sanchez de la Sierra (2019). It draws on qualitative interviews with villagers, village leaders, village elders, as well as combatants and commanders (active and inactive) of the following groups between February and July 2015: Nduma Defense of Congo Guidon, Mayi-Mayi Padiri, Raia Mutomboki, Mayi-Mayi Uvira, M23, Mayi-Mayi APCLS. The following section summarizes the result from ethnographic interviews.

resources—taxes and labour—feature most prominently. This is not particularly surprising given the limitations armed groups face in terms of finances and military capacity, but also the context of extreme poverty: generating revenue is vital both for the survival of the armed group as an enterprise, but also for its members and their dependents. The NDC deploys soldiers and weapons in strategic locations, in order to be able to counter attacks by enemy factions.[7] A significant part of the resources are devoted to controlling mines and larger trading centers. According to the former T5 (director of communications) of the NDC, the NDC initially sent delegations to all the villages that fell under its control, with the intention of leaving 1-2 soldiers per village. Following the territorial expansion of the group, troops were soon concentrated in the larger urban centers and around the mining areas, resulting in strong geographical imbalances in the distribution of military and administrative resources.[8] The distribution of resources echoes the highly unequal geographic distribution of military and administrative resources by both the colonial and post-colonial states, which faced similar logistical constraints and objectives (Boone 2003; Herbst 2000).

The NDC's modes of administration of economic, social and political activity also reflected the necessity of establishing legitimacy for the group's rule over civilian populations. Like many of the rebel groups that have controlled territory in eastern DRC, the NDC set up an elaborate apparatus of taxation and resource extraction (Sanchez de la Sierra 2019; Stearns 2011). The right to access mining sites is taxed, as well as their daily production (by searching and weighting each creuseur's production at the exit of the mining site), a mode of taxation which armed groups have applied extensively throughout the region (Sanchez de la Sierra 2019). Another mechanism to obtain revenue from the mines is the imposition of a day of "Salongo" each week to all creuseurs in each mine, during which all the diggers are required to dig for minerals and hand over the day's production to the group. Such tax-

[7] In particular the FDLR, the Alliance des Patriotes pour un Congo Libre et Souverain (APCLS), and the Congolese Army

[8] "We weren't very interested in villages with no mining activity and with a small population; Where there were mines, or in the larger centers with a strong population, that is where you could find most of our soldiers." This argument is developed more comprehensively in Sanchez de la Sierra (2019).

ation practices required a significant presence of soldiers in and around the mining sites and favoring much more intrusive and 'direct' modes of administration. While each mine has a President Directeur General (PDG), in charge of production and the organization of miners, the PDG is closely monitored by the NDC's emissaries, to which he owed full accountability. PDGs who didn't fully comply with the group's orders are killed and replaced, either by more complacent intermediaries or directly by members of the NDC. Thus, the high revenue streams generated by mining activity, and the difficulty to observe gold output (Sanchez de la Sierra 2019), prompt more direct forms of military and administrative control over that sector of the economy. The group taxes trade by setting up roadblocks and fining the access to local markets, as well as agricultural and hunting activity by imposing taxes on agricultural production, windmill taxes, taxes on the production of local alcoholic beverages (Kasiksi) and hunting taxes. The collection of these taxes relies on intermediaries, usually representatives of these sectors, but revenue streams are then highly centralized into the administration of the group (the Bureau 1), which is in charge of counting and verifying all taxation revenues.

The head tax is the most significant tax collected by the group, however. Called the 'effort de guerre' (war effort), such tax is imposed on all adults of the territory. The collection of such tax relies on local chiefs, echoing the historical role of local chiefs in the mobilization of resources. Throughout the NDC's territory, all adults are compulsorily required to pay 1,000 Congolese Francs per month. Local chiefs are tasked with reporting the number of residents to the group, and then collecting the taxes monthly. The group sends a "technical team" to conduct a village census. Once the taxes are collected, the group's envoys distribute 'jetons' (tokens) to the village chief, which the chief has to then distribute to the residents in exchange for the tax | such token can then be used to prove they had indeed paid the tax. Small groups of soldiers are tasked with carrying checks in the villages, and any person who isn't able to present a token received 50 to 100 lashes, and is asked to pay a fine of 50-100,000 Congolese Francs (US$50-100), a prohibitive sum for extremely poor rural households. Those who refused to comply are hanged or decapitated.

Like many others in the region, the NDC relies heavily on intermediaries to collect resources, setting up rudimentary forms of 'indirect rule' types of governance configurations. Furthermore, the group established what it calls "cadres civils" or "cadres politiques" (Civilian or political leaders), enrolling the territorial administrator of Walikale, and appointing a political director, to supervise political and civilian administration. These cadres were tasked, among other things, with verifying that the information on the population size of villages provided by local chiefs to the NDC was correct. Similarly, the group set up its own police force. Rather than developing an entirely new police force, the group enrolled all existing Congolese National Police officers in the areas they controlled, and required them to continue doing their work, albeit as NDC police and not national police. Along with the village chiefs, civilian administrators and police officers were also tasked with reporting the presence of Rwandophone residents in the area.[9]

Thus, the group often relies on pre-existing local authorities, cadres, and chiefs, to administer its rule. However, the heavy burden of taxation imposed by the group, and the extent of harassment by its soldiers meant that civilians and authorities were often reluctant to fully collaborate with the group. When discovered by the group, reluctance or resistance, either passive or active, entailed immediate sanctions that ranged from public beatings or lashings to executions. The existing authorities of a given area were only kept if they were "trustworthy, and followed closely the orders of the movement."

However, while replacing former state and police authorities or other local leaders is relatively straightforward, replacing local chiefs who show reluctance to comply with the group's rule is more difficult. Replacing a customary chief would immediately entail a loss in the group's military strength and legitimacy: "we could not replace a customary chief, because that would be going against our ancestors; the strength with which we fought came directly from our ancestors; the customary chiefs are the representatives of our ancestors,

[9]The NDC considered all Rwandophone civilians to be supporters of Rwandan armed groups, which they were trying to defeat and chase out of the territory. When discovered either by the group our reported by its intermediaries, Rwandophones are assassinated by the group.

so going against them is automatically going against the movement."[10]

The NDC respects important traditional chiefs, less so for less important chiefs. In the village of Kashumba, a detachment of the NDC was sent out in early 2012 with the task of recruiting soldiers for the group and 'encouraging' populations to comply with the head tax. At their arrival in Kashumba, they noted that the village had organized a local chapter of the Raia Mutomboki, an ad-hoc grassroots armed movement that had started in 2011 in the territory of Shabunda, South Kivu, and spread throughout South and North Kivu (Stearns and Vogel 2015). Upon arrival of the NDC detachment, the Raia Mutomboki pleaded allegiance to the NDC, most likely because of their superior military capacity. Through discussions with the elders held at the village's barza, however, the NDC commander was informed that the village chief had told his population that his role was not to be a host for any visitors (the NDC) and collect taxes on behalf of them, but rather to receive taxes himself as a result of his traditional authority and ownership over land. Irritated by what he heard, the NDC commander ordered his troops to heavily lash the chief, and beat him to a point of near-death. The next morning, he convened a reunion with the entire village, and further lashed and beat up the chief in front of his population, stating that the chief had brought this upon himself by refusing to follow the group's "ideology."[11]

Coercive actions towards local chiefs weaken the group's legitimacy. Although the group's leaders and a majority of its membership were natives of Walikale, which conferred to them a substantial advantage over groups perceived as foreigners (in particular the FDLR). In order to assert the legitimacy of their claims to rule and mobilize resources, the

[10]When the NDC started seizing territory in Walikale, the Mwami of Walikale, Mwami Kitanguru Serafin, fled to Goma because of the recurrent fighting, and stayed in Goma for the period, leaving the offices of the chiefdom empty. However, he had appointed an interim, Mwami Blaise Tumbiwa, who, despite not being the recognized ruler, nevertheless bore a level of legitimacy by interim. Conscious of the importance of being associated with the customary authorities, the NDC made substantial efforts to be close to Blaise Tumbiwa: "we needed to be very close to Mwami Blaise, so we were in constant contact. We would visit him in his house and he would visit us, and he would help us with the cause."

[11]Assassinating chiefs, similarly, posed a problem of succession. For chiefs tied to the custom, the group had to follow the customary procedure of appointing the chief's successor among his lineage. This could generate conflicts of succession, in which the group would give support – and often impose – a successor who seemed compliant to their cause.

group deployed a range of narratives, rituals and practices. Public meetings were organized after the conquest of a village, and then regularly throughout the group's presence in an area. The purpose of such meetings was to assert the group's coercive power by putting troop numbers and weapons on display, but also to expose the group's "ideology."[12]

2.3.2 Conceptual framework

In light of this qualitative evidence we develop a set of conjectures. The following approach draws on existing theoretical literature (Padró I Miquel and Yared 2012; Bates 1983), as well as a vast historical documentation — which includes extensive descriptions of these trade-offs faced by rulers in feudal Europe (Greif 2008), the Roman Empire, as well as a large number of other well-known historical episodes of states and Empires.

Consider a ruler/armed group, and a local leader. The objective of the group is to extract as much rents as possible from the territory under control, for direct consumption, as well as to finance the group operations and territorial expansion. The local leader cares about his own consumption, and may also value the payoff of the population under his control — whether through repeated interaction or as a private valuation of the social good in a static setting. The armed group has guns and can obtain compliance of the local population using coercion. However, coercion has limits: the group cannot obtain compliance of all dimensions of effort from the population (effort not to share intelligence or not to poison the group, for instance). The leader has a technological advantage over the group: he has local legitimacy. Legitimacy can be thought of as a lower cost of obtaining popular compliance. It can be modeled simply as a self-sustaining equilibrium, whereby it is in the interest of each villager to comply with the chief (within well-defined limits) given that everyone is complying with the chief and that others sanction deviators, as in Bates (1983) and Greif (2008). Whichever is the source, legitimacy is then internalized and has psychological expression — a feature we

[12]A video obtained by one of the authors of one of the group's public meetings in the town of Pinga shows that the group's leaders – in this case Sheka himself – would deploy extensive efforts to convince the population of the righteousness and legitimacy of the movement's objective's and rule over the village, resorting to chants, inviting local customary authorities to publicly give their backing to the group, and arguing that the group's presence would enhance cooperation and development within the village.

use in the second part of this study. In the absence of the group, the chief chooses a level of extraction to maximize his objective function. When the group controls the polity, the group can enlist the chief as his agent, and offer the chief a contract that maximizes the resources extracted for the group. Instead, the group can at a fixed cost, create an administration and vertically integrate governance of the village into the group's organization. This framework yields three conjectures.

First, a superior "technology" of chiefs to extract resources from their community renders the co-optation of chiefs (indirect rule) more attractive. Their technology depends on the sources of their power | chiefs who follow the traditional succession dynasties, who have been enthroned through a traditional ceremony, who have bigger supernatural powers, and who the dead ancestors have explicitly approved as a legitimate chief have an advantage over the rest of chiefs. In the presence of incomplete contracts, they are able to solve hidden action problems and engender collective action and taxation, appealing to the mystical foundations of their power. Furthermore, chiefs who share the ethnicity of the villagers, while the armed groups do not, have a drastic advantage over the group at mobilizing resources in their communities | this is dramatically true for the case of armed groups that are of Tutsi or Hutu backgrounds.

Second, since creating a village administration entails a fixed cost | the group must build the social networks and acquire the information that is required to administer the village | groups that govern for longer periods of time will be more likely to prefer developing an administration of direct rule to circumvent the agency problems present in the cheap indirect rule mode of governance. Furthermore, as the group's rule extends over time, the cost of creating direct rule decreases, since the informational disadvantage they have over the chief decreases over time | learning.

Third, investing in a costly village administration exposes the group to risk. Specific locations, at certain points in time are close to territorial boundaries, where control is contested by enemy groups and the state. Such locations are temporarily less attractive for direct rule, since the state (or the competing armed group) is more likely to destroy armed

groups' capacity militarily.

Finally, the weaker is the bargaining power of the chief vis-a-vis the armed group, the more attractive it is for the armed group to co-opt the chief. Chiefs that can easily be succeeded by equally legitimate local leaders should be more likely to be co-opted, since they can be exploited more. Furthermore, the armed group will take actions to reduce the power and the outside option of village chiefs in an effort to increase the rent they can afford to extract. For instance, the armed groups often try to undermine the technological advantage of chiefs by creating their own sources of legitimacy. They can achieve this by imposing their own traditional doctors and witches and killing those who connect with dead ancestors and who support the chief. We are able to observe all such episodes with high level of accuracy since 1995, as our qualitative evidence and cross-referencing suggests.

In this paper, we focus on the first two conjecture, which we can test using the data we collected.

2.4 The data

This section describes the data collection, and presents the main variables used in this study. The data is a subset of the data collected in Sanchez de la Sierra (2019), and focuses on detailed mapping the history direct and indirect rule arrangements. The data collection strategy is described extensively in Sanchez de la Sierra (2019).

2.4.1 Approach to data collection

The data focuses on 106 villages of Eastern Congo in the province of North Kivu. The data collection protocol contemplates the following data collection design in 7 days in each village to reduce measurement error and strategic misreporting of information.

First, the surveyors identify a group of "history specialists" on the first day in the village. In practice, the history specialists are individuals who best master the village social history. Surveyors identify them easily due to the local tradition of oral history: history

specialists are often village elders. Surveyors then train the history specialists on how to collect historical data. In each subsequent day, the surveyors monitor how the history specialists collect data. In the last day in each village the surveyors hold a day-long meeting with the history specialists, where they confront the data to additional data collected by the surveyors themselves from other sources. The data from this meeting is the main source of data used in this study. Second, to address the possibility of recall error and systematic reporting bias by the history specialists, the surveyors implement 6 household surveys in private during the 7 days. In each household survey, they reconstruct the history of the village during a 4 hours discussion. Third, the survey implemented during the day-long interview with the history specialists at the end of the village visit has multiple sources for key variables, which we use as cross-validation. Fourth, the surveyors implement an exhaustive set of time cues to reduce measurement error associated with years (de Nicola and Gine 2014). Surveyors use common knowledge regional events as a reference to locate the events reported by the respondents in time. Anecdotal evidence suggests this strategy was very effective at identifying years with little or no uncertainty. Fifth, survey questions focus on transitions and events easy to memorize. Sixth, surveyors draft a qualitative report in each village, where they describe the history of the village, all groups that held a monopoly of violence, their activities and their motivations. To draft these reports, surveyors use the information acquired in the different surveys, as well as additional in-depth interviews with combatants, ex-combatants, and other civilians. Section B.3 in the Appendix provides a detailed discussion of measurement and our solutions to common issues.

2.4.2 Measuring armed groups' control and institutions of governance

We focus on armed actors who control a given village for at least one month. Surveyors and villagers usually refer to a group that controls a village as its "organization of security" in the village. These are a very common phenomenon in Eastern Congo. Villagers easily distinguish between such situations and, for instance, marauding bandits, who may be stationed in other villages but who came to pillage in this village.

Using the same strategy, we obtain detailed information for all chiefs that were present in the village since 1990 and all groups that had any kind of control of the village on the following outcomes. First, we collected the dates when a group controlled the village and properties of the group, including ethnic composition, kinship ties with the chief and local population, internal organization of the group, and all types of administrative capacity created by the group. Second, for each chief, we document the history of contracts they had with armed groups (the "institution"), the details on the deliverables expected by the group (for instance, collection of poll taxes, mobilization of recruits, gathering of information, lobbying to gain the population support for the group, superstitions), the performance on such dimensions (delivery) the prevailing threats on the chief, as well as any instance of realized sanctions of the chiefs and their details. We also collect data on all taxes paid by villagers, and how tax collection is organized, as well as the history of the mobilization of recruits and when these happen, how they are organized. Third, for each chief, we obtained dates of throning and departure, causes of throning and departure, network data, land ownership data, and information on the availability of successors at any point in time. With the geographic coordinates collected during the survey, we linked this data to geographical shapefiles we obtained from the Réferentiel Geographique Commun.[13] This source contains the map of the road network of the DRC, all airports (including small landing lanes), the location of forests, rivers, lakes, and the regional capitals.

In addition, for each armed group episode, to examine the details of the administrations armed groups created to rule their territory using direct rule, we gather detailed yearly information about the episodes in which armed groups create their own administration. We also observe the types of taxes they create, their amounts and frequency, the agencies they create, the staffing, the administration of justice, the creation of intelligence agencies to combat tax evasion, and the creation of armed groups' economic monopolies (of beer, liquors, and cigarettes), which are mechanisms often used by armed groups to extract revenue from their territory when they rule directly.

[13]See Référentiel Géographique Commun (2010).

2.4.3 Measuring the psychological expressions of chiefs' legitimacy

Legitimacy, even in its most mechanical definition as a self-enforcing equilibrium (Tilly 1985), is likely to be internalized and thus have psychological implications | of positive or negative attitudes towards ruling chiefs. Measuring legitimacy is challenging, mostly because it is a loosely defined concept, and because most self-reported measures are likely subject to self-reported biases, both through the conscious processes they activate, and through social desirability biases arising from the presence of the surveyor. We focus on the unconscious positive and negative associations that villagers hold towards individual chiefs, and towards traditional institutions in general. To measure the unconscious associations of the population towards armed groups and leaders, we administer Implicit Association Tests (IAT), to a random sample of villagers in each village. IAT's were developed in the psychology literature (Greenwald, McGhee, and Schwartz 1998; Nosek, Greenwald, and Banaji 2006; Bluemke and Friese 2008) and recently introduced in economics (Lowes et al. 2015, 2017). In particular, we administered the IAT to capture implicit associations towards armed groups that are in the region, armed groups that controlled the village, all chiefs of the village since 1990, traditional institutions in general, as well as the Congolese state.

IAT's, administered usually on a computer, allow eliciting unconscious attitudes between pairs of objects. The left of the screen shows a smiling (sad) face, and the right a sad (smiling) face. Subjects are then presented with a dozen of faces that appear sequentially at the center of the screen, and have to sort such faces (smiling or sad) to the left or right of the screen, so that smiling faces are sorted to the side where there is a smiling face, and vice versa. There is a strong association between smiling faces that appear in the center, and the smiling face on the side, which makes sorting intuitive and fast. In the next round, a photo of the face of the chief is displayed on one side, below one of the side faces, and the task is repeated. In a third sequence, the face of the chief is presented on the opposite side and the task is repeated. If subjects are asked to sort smiles to smiles in the presence of the chief's face next to the smiling face on the side, this would be much less intuitive and would take

longer if the subject has a negative association towards the chief. In contrast, if the photo of the chief would be displayed below a sad face, sorting sad faces that appear in the center towards the sad face on the side would be more intuitive if subjects negatively associate with the chief. This pattern is systematically present for images that clearly generate negative associations (such as spiders, snakes): subjects take much longer and make more mistakes when they have to associate smiling faces to the side of the smiling face if a "bad" image is displayed below the smiling face on the side. In contrast, subjects will make less mistakes if the "bad" image is displayed below a sad face: sorting sad faces to sad faces is easier because "bad" images are associated with sad faces. This is what Nosek, Greenwald, and Banaji (2006) propose as a measure of so-called system 1 in dual process theory, implicit attitudes towards an object, before they are rationalized by so-called system 2 and without the subject's awareness of them. Figure B.8 presents the results of this benchmark implicit association tests.

Prior to administering the IAT's, we obtained in each village the detailed names of the village chiefs since 1990, and recorded all possible names, accompanied with "chief" prior to implementation. Surveyors then went back to the 106 villages and visited a random sample of households that had lived in the village since 1990 (and hence lived through all chiefs). Surveyors administered the IAT's to these households on tablets. In addition to sound IAT's, for current chiefs, we obtained the chief's approval to have their photo taken and then displayed in an IAT to be implemented on households. To collect implicit attitudes towards groups, showing armed groups' images in the IAT posed a risk. Instead, we systematically recorded the names of all the possible groups that have been active since 1990, and implemented IAT's using sounds for the name of each armed group that was ever in the village as well as a set of 12 major groups administered commonly in all villages. Since group names are known, we provided the surveyor with a list of armed groups' names, from where they choose which ones to implement. In this draft, we present the results from the classic IAT's using the photo of the village chief, thus we restrict the analysis to chiefs that are still in charge today.

2.5 Defining and measuring indirect rule

Traditional chiefs: the rule of the custom

Figure 1 presents basic data on the information we collected about chiefs. We covered 106 villages since 1950, and obtain a dataset of 456 chiefs of Nord Kivu. The upper left panel shows the distribution of the number of chiefs recorded in each village since 1950. The modal number is 3, and a group of villages experience a high turnover of chiefs, having up to 10 chiefs since 1950. The upper right panel shows the usual length of reign, ranging from 1 to 60 years. The median length of reign is 10 years, and the mean reign lasts 15 years. The bottom left panel shows the percentage of land that belongs to the chief. The distribution is bimodal, indicating that chiefs often either own all the land, or no land at all. The variation in land ownerships provides a useful proxy for the sources of chief power. Finally, the lower right panel shows the causes of chiefs' turnover. The majority of chiefs go because of natural deaths due to illness and age. A significant number of chiefs died assassinated, by firearm, poisoned or bewitched.

Armed Groups territorial control

Following the methodology used in Sanchez de la Sierra (2019), we consider a village to be controlled by an armed group when an armed actor holds a stable monopoly of violence for a significant period (usually at least a few months).[14] We collect the number of months of each armed group episode, 7 of them are shorter than 6 months. We observe 258 armed group episodes in 106 villages by 42 different armed groups.

Armed groups' episodes of governance vary starkly in their motives, and origins. Sanchez de la Sierra (2019) examines two categories of armed groups: armed groups that originated in the village and external groups that come from outside. The literature on the Kivus notes that in contrast to South Kivu, North Kivu mostly experienced rule by external groups.

[14]This definition was applied while collecting the data however, surveyors were instructed to also include armed group episodes of shorter duration as long as the armed group intended to stay in the village.

Our data supports this claim: only 10 episodes of armed groups originated in the respective village, while the proportion is larger for Sud Kivu.[15]

Figure B.2 presents basic data on the episodes of armed groups' rule in the villages of the sample. The upper left panel shows the frequency with which villages experience armed groups' governance episodes since 1990. The median occurrence is 3 distinct episodes since 1990, with some villages experiencing up to 6 episodes. The length of control varies from 1 to 25 years. The median stay of a group is 3 years, and the mean is 4 years. The resulting number of years a village is "occupied" by an armed organization since 1990 is presented in the lower left panel. While some villages are occupied for the entire period, the median occupation length is 10 years, and the mean is 15 years. Finally, the lower right panel shows the groups who rule in the different territories of Nord Kivu in the data. Walikale, a remote territory, has experienced the largest exposure to armed groups' rule, mostly dominated by the RCD, the MM (Mayi-Mayi regional militia), the Congolese Army (FARDC) battalions, and a large number of other groups. In the period, the Congolese Army is largely absent from the villages in the sample in the territory of Rutshuru, Masisi, Beni, and to a lesser extent, Lubero. Figure B.3 shows the evolution of territorial control in the villages in the sample, and their production sites, by militia, external armed groups, and army battalions.

Armed groups' direct rule and indirect rule: dimensions and trade-offs

Measuring direct and indirect rule is challenging, because there is no natural dichotomy in the institutional design by the armed groups. We thus propose a systematic approach, that constructs vectors on a number of well-defined relevant dimensions, that reflect the choices of armed groups and chiefs along each of the dimensions.

To operationalize direct rule, we break down institutions into: extraction of resources (taxation and tribute), extraction of labor services (recruitment), legitimation (efforts to

[15]We exclude these 10 episodes from the analysis for straightforward reasons: firstly, homegrown armed groups are likely to have very different objectives and strategies with regards to governing the village making it difficult to combine both cases under the theoretical framework of external armed groups who come in to govern. Secondly, chiefs are often heavily involved in the organization of homegrown groups. Including them blurs the line between direct and indirect rule. Nonetheless our results hold when we include these cases).

indoctrinate the population in support of the group), administration of the village, the allocation of political power, the provision of public services, and the regulation of economic activity. Table B.1 presents the data of the political dimension for Nord Kivu and Sud Kivu, since it is the only rule variable that already existed in the Sud Kivu datasets. Of 508 total armed groups' episodes, in 32% the chief has the political power, in 20% the political power is shared, and in 38% the power is in the hands of the group. Note that consistent with qualitative research on eastern Congo, North Kivu is remarkably organized with direct rule, and Sud Kivu with indirect rule along this political dimension. Figure B.4 presents the data along each of these dimensions—the data is in year×village observations for each episode of armed groups' rule.

For the collection of taxes, we observe whether the group receives a head tax, and whether the head tax is collected by the group directly. We also observe whether the group raises a toll tax, a mill tax, a market tax, and whether the group creates forced debt—all these sources of revenue are always directly organized by the group, so their mere existence is an indication of direct rule. However, head tax is often organized by the chief for the group, since the head tax is the tax that generates most resentments among the population, and where legitimacy is crucial to maximize extraction. More than 70% of groups raise a head tax, and about half of them collect the head tax directly. Groups organize toll taxes, mill taxes, market taxes, and forced debt between 10% and 60% of cases, whereby toll tax and market tax are raised in more than 50% of cases.

For the mobilization of labor services, we observe who recruited new members for the group, and whether the chief encouraged recruitments. The chief is involved in recruitment in approximately 20% of cases, but the group recruits directly themselves in 55% of village*year observations of episodes of armed group rule. For legitimation, the group is directly engaged in organizing propaganda campaigns for the group in 40% of cases, and organizes rituals in 30% of observations. The group also hunts local witches, to replace them with their own witch doctors, in 17% of village×year observations.

For the properties of the armed groups' administration, we observe whether the armed

group administers the village, the presence of written documents for administration, a written constitution, written contracts, written official communications by the group, and the existence of a group seal. We also observe whether the group administers justice. In 75% of cases, the group administers the village directly, and organize justice for the village. Surprisingly, written official documents by the group and a group official seal exist in the majority of cases in which the group administers the village.

For the allocation of political power, we observe who holds the political power in the village: in 55% of the cases, the political power is in the hands of the group, while it is either shared with the chief, or entirely delegated to the chief in 45% of cases. The military presence of the group equals approximately 10 armed men on average, per village×year of armed group rule.

To measure the provision of public service, the group provinces security in almost 50% of the time, but only rarely provides health, education, roads, or other public or private services (approximately 5% of the time).

Finally, for economic regulation, the group regulates traffic 50% of the time, create a local market only 8 times in the sample, regulate private firms 7% of the time, and is directly engaged in trade in 10% of cases.

To operationalize indirect rule, we break down the pressure exerted by the group on the traditional chief along 5 dimensions: extraction of resources, extraction of labor services, legitimation efforts, administration, and political power. For taxation and tribute, the chief is involved in tax collection of the poll tax in 65% of the time an armed group is ruling. For recruitment, in 10% of cases, the chief is directly involved in recruitment, and 55% of observations have an armed group recruiting directly. For legitimation, while 25% of the time, propaganda campaigns are organized by the chief for the group, 40% of the time it is the group directly. For administration, the chief only administers the village, or justice, in 20-25% of cases. Finally, for political power, the chief has all the political power in 20% of cases, and shares the power with the group in another 22% of cases.

We operationalize this categorization by first projecting all activities into their respec-

tive dimension, for instance taxation for the taxation variables. We do so using principal component analysis. Equipped with one variable for each dimension of direct and indirect rule, we then construct a z-score index for indirect rule, and a second for direct rule.[16] We can thus interpret regression results as increases in one standard deviation of the normalized score. We present the results on each of the indirect rule, and direct rule, dimensions, in addition to the standardized scores.

Figure B.6 shows the proportion of observations in which a group is seen as legitimate, and the types of resistance that the group faced. A group is legitimate in 30% of cases. Groups rarely face peaceful resistance or demonstrations, but do face popular armed resistance in 20% of cases. While bewitching and poisoning of groups' members is extremely rare (although not unobserved in the data), the most common form of resistance is passive resistance: population fleeing the village. Displacements occur in 35% of cases in which an armed group exerts stable influence in the village. Note, however, that displacements generally occur the first year of armed group's rule, following the first attack by the group, which is usually aimed at deterring resistance, signaling strength, and punishing villagers who have collaborated with the competing group who formerly controlled the village.[17]

2.6 When is direct rule preferred to indirect rule?

This section presents the results on the analysis of the determinants of indirect rule.

2.6.1 Empirical strategy

The large number of village level arrangements that armed groups develop in eastern Congo to rule individual villages allows us to exploit yearly within village, within chief, as well as within armed group variation across years to explain the formation of indirect

[16]The z-score index normalizes each of the dimensions by subtracting their mean and dividing by their standard deviation, then adds the normalized dimensions, and normalizes the sum again. We end up with one normalized variable for indirect rule, and another for direct rule, whose interpretation in a regression is straightforward, since it has mean zero and standard deviation of one.

[17]Groups understand attacking their own tax base is not a very intelligent idea.

rule institutions, of direct rule, and of armed rule in general. In particular, we examine, within armed groups episodes, across villages, and using year fixed effects how changes in the ethnicity of the village population, chief, and armed group, determine the type of institution the armed group ends up creating.

As an illustration, to estimate the impact of the ethnicity of the armed group, and of the chief, at the time of designing institutions on the type of rule that emerges, we implement the following OLS regression:

$$IndirectRule_i = \alpha + \beta_1 CoEthnic_{it}^{AG,V} + \beta_2 CoEthnic_i^{C,V} + \theta_{AG} + \eta_t + \epsilon_V$$

where the observations are restricted to the first year of the group. The indexes AG, V, C stand respectively for armed group, village, and chief, and $i = 1, ..., 256$ stands for the armed group's episode. We examine additional determinants by replacing $CoEthnic$ with the corresponding variables. We include armed organization fixed effects (there are 46), θ_{AG}, to account for the fact that certain organizations have systematically different ethnicities than the villages they control. We also include year fixed effects, η_t, and cluster standard errors at the village level.

To estimate the effect of armed groups' tenure on the institutions they create, we use the data that contains all years for each armed groups' episode, and the evolution of the institutions over time, within each episode. To account for any unobserved constant heterogeneity at the group level that may correlate with institutional choice, we include armed group's episode fixed effects. To account for the fact that more tenure correlates with years, we also include year fixed effects. Since episode is more disaggregated than armed organization, we do not need to include armed organization fixed effects. We also project the institutional variables on group tenure year effects, controlling for year fixed effects as well as episode fixed effects.

2.6.2 Results

We first present the results of the initial conditions, and then, the results of the time/tenure effects. For the initial conditions, we focus on ethnicity, kinship networks, and the allocation of land property rights in the village. For the time dimensions, we examine the role of learning and expectations. To do so, we examine the role of the number of years the armed group has been ruling, and the number of years the chief has been ruling.

Initial conditions and endogenous institutional choice

We first examine the role of the relative advantage of the chief in terms of its "social technology" vis a vis the armed group. We proxy for social ties with the population using the coethnicity of the chief and the population it governs, as well as the coethnicity of the armed group and the population to govern. An armed group that is foreign to the village faces a substantial disadvantage if they want to rule directly and may be more tempted to rule through the chief. Furthermore, chiefs who are not coethnics of their villagers are likely to have worse "social technology."

Table B.2 presents the results of regressing initial direct rule on the coethnicity dummies. Clearly, chiefs who share ethnicity with their population do not tend to be replaced by the group. If the chief shares ethnic ties with the population, taxation is less likely to be organized by the group, so are public services, regulation of economic activity, justice, and political power. Overall, episodes in which the starting chief is coethnic with his population have direct rule indices which are 1.7 standard deviations lower. Table B.3 shows the corresponding results for the indirect rule dimensions. Correspondingly, if the chief at the starting year of an armed group episode shares ethnic ties with the population, the armed group is more likely to delegate the governance tasks to the chief, especially administration and justice. Overall, chiefs who share ethnic ties with the population at the start of an armed group episode have indirect rule indices that are 1.2 standard deviations higher than the rest.

To examine other forms of chiefs' ties with their population, Table B.4 presents the results on kinship connections between the chief and village families. While there is no clear relationship that emerges, chiefs who are well connected with their villagers are less likely to engage in taxation for the group, and more likely to organize legitimation campaigns for the group. When chiefs are better connected with the villagers, the group is more likely to have a larger force in the village, and to administer the village directly while letting the political power in the hands of the chiefs.

Table B.6 presents the results using as a predictor of chief power the proportion of land owned by the chief in 1998. Since chiefs who concentrate land ownership may have more coercive power, but may be disliked by the population, the theoretical expectations are ambiguous. Furthermore, chiefs who have strong power can undermine the surplus extracted by the armed group. Thus armed groups may be tempted to rely on the local chief, but at the same time to undermine their power, through, for instance, substituting their rule through direct rule. Table B.6 suggests that chiefs who own the land are less likely to be allowed to organize justice, administer the village, organize recruitments, or hold political power, thus less likely to be used for indirect rule. The group is also more likely to provide services, administer justice, and hold the political power themselves. This suggests that armed groups dislike to delegate tasks to chiefs who concentrate land ownership, consistent with the conjecture that armed groups struggle more to extract rents from chiefs that are too powerful.

Learning about the village

We then show the results on armed groups' tenure. Over time, armed groups should have the means, and the desire, to invest in institutions of direct rule. Table B.8 shows the results from the main specification. We regress the institutional variables on year effects, armed group episode fixed effects, and on armed groups' tenure. The upper panel shows that group tenure significantly increases direct rule along the dimension of taxation, administration of the village, organization of justice, and military presence in the village. Overall,

an additional year of tenure in the village increases the direct rule index by .5 standard deviations. The lower panel shows the identical regression for the indirect rule index. While group tenure also increases the organization of taxation through indirect rule (thus suggesting that taxation is heavier over time), the tenure of armed groups reduces the reliance on chiefs for legitimation efforts, administration of the village, organization of justice. Overall, an additional year of tenure by the armed group reduces the indirect index in .38 standard deviations.

Figure B.7 presents the year coefficients for an additional year of armed group's tenure. We project the institutional variables on year effects, armed groups' episodes fixed effects, and dummies indicating the number of years of armed group's tenure. Panel A presents the results on the indirect rule index, panel B for the direct rule index, and panel C for the difference between the two. The red lines indicate the upper and lower bounds of the 95% confidence intervals. Clearly, additional years of armed groups' tenure consistently decrease the reliance on indirect rule, and increase the investments in direct rule.

Also chiefs may increase their ability to mobilize resources over time. Thus, armed groups who aim to start a governance episode when facing an experienced chief may be more tempted to rely on the chief. Table B.10 presents the results of the initial tenure of the chief at the start of the armed group episode. Clearly, armed groups are more likely to delegate administration and justice to well experienced chiefs, but the results on the direct and indirect rule indices are insignificant.

This section has shown that armed groups vary substantially in the type of institutions of governance they create and has provided a few reasonable explanations for why they might vary. While they are more likely to rely on chiefs who share ethnic ties with their villages, and are thus more legitimate and more effective at mobilizing resources, they tend to rely less on the chiefs if the armed group has already ethnic ties with the population, thus needing less the rule of the local chief. Furthermore, the armed groups on average always invest in creating institutions of direct rule over time. The longer they stay in power, consistently, the more they penetrate into the day to day life by creating direct rule along

most dimensions of governance.

2.7 Long-run implications of indirect rule

We examine the impact on a chief of being part of indirect rule on measures of legitimacy collected in today's implicit association tests. For each village, we compute the number of years a current chief has been in power, and for each year, we compute an indirect rule index. For years in which no armed group was present, we need to have a comparable measure for indirect rule. Thus, we compress the indirect and direct rule indexes to scores from zero to one, and assign the value zero to years in which no armed group is ruling. We then sum the indirect rule scores for all years a chief has ruled, thus obtaining an effective indirect rule index for the current chief | or alternatively, a weighted sum of the years under indirect rule, where more intense indirect rule year is weighted more heavily. We also use survey based measures of support for the current chief, and implicit association tests aimed at capturing unconscious biases in favor and against the chief. We run the following specification:

$$BIAS_i = \alpha + \beta_1 \sum_{t=1}^{t=T_i} Indirect_{ti} + \sum_{t=1}^{t=T_j} Direct_{ti} + \epsilon_i$$

where $Indirect$ and $Direct_{tj}$ are the indirect rule and direct rule indices for chief i in year t of the chief episode. The dependent variable $BIAS_i$ is a standardized z-score for the IAT bias against chief i. Note that each chief has different tenure, hence receives a different number of elements of the sum. Clearly, if chiefs who enjoy more positive support are also more "productive" from the perspective of the group, examining today's support for the chief, which is post-treatment, is endogenous to selection into indirect rule by different types of chiefs. In particular, if there is positive selection, in the sense that chiefs that enjoyed better popular support are more likely to be hired as agents for the group as part of an indirect rule arrangement, were we to find a negative association between participation into indirect rule and support today, the selection effect would be working against the erosive effects of indirect rule on legitimacy. We thus examine the association between participation into

indirect rule, and popular support today, in order to obtain an upper bound of the effect of indirect rule on legitimacy.

Figures B.8 and B.9 present the benchmarking results for validity of the implicit association tests. Images that are expected to be negative receive a negative bias score in the implicit association tests (snakes, and armed groups known to be disliked).

Figure B.6 report the outcomes of armed groups' legitimacy. Overall, 30% of group episodes are associated with a rule of an armed group that is legitimate. Since survey self reported responses can be subject to bias, we use both survey responses and implicit association tests in the regressions.

Tables B.12 and B.13 present the results, using respectively the implicit association tests and the survey based variables. Both tables present the results of regressing a measure of support for the chief on each dimension of indirect, and direct rule. Table B.12 shows that indirect rule along the political dimension is associated with a higher standardized implicit association tests score, indicating a positive bias in favor of the chief. Since chiefs that evoke positive biases are more likely to be selected for indirect rule, this specification clearly produces a biased coefficient. However, the coefficient has a positive bias, indicating that if there is a negative effect of indirect rule on the bias towards the chief, such negative effect is not sufficient to swap the sign of the coefficient. The result on the overall indirect rule index similarly is positive and marginally significant. Table B.13 replicates this result using instead the survey based variable of support (love) for the chief. The results are identical, albeit the positive effect of indirect rule on support for the chief turn significant in the following dimensions: taxation, administration, political, public service. Similarly to the previous table, the coefficient on chief recruitments, the most drastic form of indirect rule, is negative, albeit not significant.[18]

[18]Future versions of this research will examine the entire history of chiefs in the village, and control for initial levels of chief's legitimacy. They will further use variation over time in the trade-offs faced by armed groups as an instrument for each chief's exposure to indirect rule.

2.8 Conclusion

This paper examines the type of governance institutions created by armed groups since 1990 in a sample of 106 villages of Nord Kivu. We find that armed groups vary richly in the type of institutions they create, along multiple dimensions. We propose an approach to systematically operationalize the type of armed group's governance along an indirect rule vector, and a direct rule vector. We find that armed groups are more likely to choose indirect rule when they do not have ethnic ties with the village population, and when the traditional chief instead has ethnic ties with the population, and is hence, better able as an agent for the group. We further find that over time, armed groups consistently create institutions of direct rule, progressively penetrating all aspects of the political and economic life of the village as years under control increase. Using implicit association tests and survey data, we find no evidence to sustain that exposure to indirect rule undermines the support for the chief.

3 | You get what you pay for? Can certification programs contribute to increased public service delivery?

3.1 Introduction

A large recent literature highlights the importance of weak states in explaining low public service delivery (Acemoglu 2005; Besley and Persson 2009; Dell, Lane, and Querubin 2018; Michalopoulos and Papaioannou 2013). States with strong bureaucratic and fiscal capacities have the potential to serve significant shares of their societies with public service delivery. In contrast, fragile states lack these capacities (Acemoglu 2005; Herbst 2000; Michalopoulos and Papaioannou 2014). Given its importance, an understanding of the sources of state strength has demanded considerable recent academic attention (Acemoglu 2005; Besley and Persson 2009, 2010; Centeno 1997; Fergusson, Larreguy, and Riaño 2018; Thies 2005, 2007; Sanchez de la Sierra 2019). However, little is still known about the incentives and ability of governments to invest in state capacity to overcome low service delivery.

We develop a theory that highlights the short-term unobservability of state-capacity investments as a constraint to those investments and thus service delivery. We consider an adverse selection, two-period model where municipal politicians are either honest or corrupt. Both types care about rents from holding office, but the former shares the voters' preferences and the latter enjoys funds appropriated from the public treasury. In our stylized model, municipal incumbents can allocate their budget into current public service delivery, state-capacity investments, or fund appropriation. While state-capacity investments entail lower current public service delivery, they lead to a more efficient future public service delivery.

We consider the case where these investments are socially desirable. Voters decide whether to re-elect the incumbent between periods. While voters can observe if the budget was spent entirely into current public service delivery, otherwise they cannot distinguish at the time of the election whether the incumbent appropriated or invested the budget.

We show that, when the possibility of a corrupt incumbent in a municipality is sufficiently high, investments in state capacity are not feasible. This follows from the fact that, when voters do not see the budget being spent entirely on current service delivery, they are more likely to think that they have a corrupt incumbent that has appropriated the budget than an honest incumbent that invested in state capacity, and thus vote the incumbent out of office. This result is consistent with the low baseline levels of state capacity and service delivery in contexts like Mexican municipal governments, where local corruption is substantial (Chong et al. 2015; Larreguy, Marshall, and Snyder 2018). The model thus highlights how the short-term unobservability of state capacity investments constrains such investments and ultimately limits service delivery.

We then analyze the effect of a program that aims to publicly certify the effects of state capacity investments on overall service delivery by municipalities. We model the certifier as a third party endowed with the unilateral right to certify that the municipal budget has been partly spent on state capacity investments. Third parties, however, are corruptible with a certain probability. We first show that the certification of state capacity investments, which naturally increases with program availability, is increasing in the level of corruptibility of the third-party. We then show that, while certification cannot reduce the overall service delivery of municipalities *on average*, it has important redistributive consequences across municipalities that adopt the program. Specifically, we show that the effect of certification on overall service delivery is lower in municipalities where incumbents are certified by third parties that are likely to be corrupt, and where municipal incumbents are likely to be corrupt.

We assess the empirical relevance of this theory by testing the model's empirical predictions in the context of the implementation of Mexico's *From the Local Agenda* (Agenda desde lo Local, ADL) program. The ADL program was first implemented by the federal

government in 2004, in collaboration with state governments, following the United Nations Local Agenda 21—an action plan to promote sustainable development by strengthening the institutional capacity of local governments. The ADL program consists of four main stages: (1) self-diagnosis by municipal government officials across 39 indicators of state capacity and public service delivery, which can be designated a red, yellow, or green status; (2) third-party verification of this diagnosis by a local institution of higher education, which results in the municipality receiving a certificate for having already achieved green status on any given indicator; (3) time for municipal government officials to invest in improving non-green areas; and (4) updated self-diagnosis and third-party verification, again resulting in the granting of certificates for each new indicator that receives green status in the municipality.

We identify the effects of the ADL certification program by using a generalized difference-in-differences design to leverage temporal variation in take-up of the program. To avoid comparing municipalities that took up the ADL program with those that never did it, we focus only on the sample of municipalities that ever decided to participate in the program. We proxy for the likelihood that a certifying third-party is corrupt with municipal political alignment with the state government, based on the fact that the state-dependent institutions of higher education that serve as third-party auditors have been involved in various cases of corruption . We further use low baseline levels of certification upon entry into the program to proxy for corrupt incumbents. As our theoretical model highlights, municipal incumbent corruption should be associated with low state capacity and public service delivery. Empirically, we cannot differentiate between state capacity investments and public service delivery, and thus focus on the combination of the two—as measured by ADL program indicators—as our primary outcome.

The results are largely in line with the empirical predictions of our theory. First, we observe increased certification in municipalities politically aligned with the state government, which validates our use of such an alignment as a proxy for the likelihood that a certifying third-party is corrupt. Second, we find no discernible effect of certification on overall public service delivery on average, which is consistent with a high fractions of corrupt certifying

third parties and municipal incumbents. Third, the results indicate that certification led to overall lower public service delivery in municipalities aligned with state government, and where baseline certification levels were low.

These findings advance the literature on the determinants of state capacity by considering the effectiveness of programs designed to encourage long-dwindling investments in state capacity. This literature initially focused on whether and how inter- and intra-state conflicts, as well as population density, have contributed to fiscal state capacity in Europe (Tilly 1990; Gennaioli and Voth 2015), Africa (Herbst 2000; Sanchez de la Sierra 2019; Thies 2007), and Latin America (Centeno 1997; Thies 2005). In contrast with extant studies seeking to explain the impetus for investments in capacity, we study the role that certifying programs aimed at strengthening local bureaucratic capacity to improve service delivery can play in creating political incentives for investments in state capacity (see also Soifer 2015; Fergusson, Larreguy, and Riaño 2018). Like Banerjee, Duflo, and Glennerster (2008) and Raffler (2018), we also highlight the difficulty of designing incentive structures to prevent manipulation—in our case, of a political form.

Our paper also relates to previous work showing that varying the visibility of policy outcomes to voters can generate policy distortions (Mani and Mukand 2007; Marx 2018). Marx (2018) finds that incumbents in Sub-Saharan Africa are rewarded only for completing projects in visible sectors, namely projects providing basic infrastructure and social services, which leads incumbent only to focus on the completion of visible projects before elections. We highlight that programs aimed at strengthening local state capacity, whose implementation might be more visible than outcomes of policies that directly benefit voters, might actually lead to the crowd out of such policies, especially in contexts where significant program design flaws are present.

Lastly, our paper adds empirical rigor and theoretical clarity to extant research casting doubt on the effects of the ADL program on municipal development. In particular, Pérez Archudia and Arenas Aréchiga (2012) report the lack of a significant positive correlation between actual municipal development and ADL program assessments of municipal

government capacity for good governance and municipal development. Pérez Archudia and Arenas Aréchiga (2012) conclude by questioning how well the ADL program assessments capture municipal government capacity and municipal development. We similarly find a weak association between program certification and state-capacity and public-service-delivery outcomes, when implementing a plausible identification strategy. We additionally find evidence supporting that this finding is driven by adverse effects of certification when certifying third parties and municipal incumbents are corrupt.

3.2 Theoretical model

We develop a theory that highlights the short-term unobservability of state capacity investments as an impediment to such investments and thus service delivery. We first characterize the equilibrium outcome in the absence of a state capacity investment certification program. Second, we characterize the equilibrium outcome when there is a program certifying state capacity investments. Third, we asses the effect of the certification program on overall service delivery by certified municipalities.

3.2.1 Agents, actions and preferences

We consider a stylized two-period model for a representative municipality. In every period t, the incumbent politician of type τ, which we discuss later, allocates a unit of budget entirely into: (i) current service delivery, $g_t^\tau \in \{0,1\}$; (ii) investing in improving state capacity, $s_t^\tau \in \{0,1\}$; or (ii) public-rent appropriation, $r_t^\tau \in \{0,1\}$. Although such allocations are less stark in practice, they highlight the core theoretical logic.

A homogeneous set of voters decide whether to reelect their incumbent politician or vote for an alternative candidate in between period one and two, $v \in \{I, A\}$. In the baseline model, voters can only observe whether the incumbent spent the entire budget on current public service delivery. In other words, voters cannot tell whether their incumbent appropriated the budget funds ($r_1 = 1$) or invested in state capacity ($s_1 = 1$) if $g_1 = 0$.

Voters derive additive utility from public service delivery. Specifically,

$$U(g_t, s_t) = \sum_{t=1,2} s_t + \beta_\tau g_t,$$

where $\beta_t \in \{\overline{\beta}, \underline{\beta}\}$ determines the value of public services to voters, such that $\overline{\beta} > \underline{\beta} > 1$. While voters start with $\beta_1 = \underline{\beta}$, the law of motion of β_2 is as follows:

$$\beta_2 = \begin{cases} \underline{\beta} & \text{if } s_1 = 0, \\ \overline{\beta} & \text{if } s_1 = 1. \end{cases}$$

In other words, while investments in state capacity entail a short term loss in public service delivery (since $\underline{\beta} > 1$), they increase the efficiency of future public service delivery (since $\overline{\beta} > \underline{\beta}$). Whether state capacity investments increase overall service delivery depends on whether the benefit, $\overline{\beta} - \underline{\beta}$, exceeds the opportunity cost $\underline{\beta} - 1$. For the model to be interesting, we impose the following condition:

Assumption 1. $1 + \overline{\beta} > 2\underline{\beta}$.

There are two types of incumbent politicians, $\tau = \{h, c\}$. With probability γ the incumbent is honest ($\tau = h$), and with probability $1 - \gamma$ the incumbent is corrupt ($\tau = c$). Both types receive per-period rents from office, $R > 0$. Honest politicians also share voters' preferences over public service delivery, but do not derive utility from public-rent appropriation. In contrast, corrupt politicians derive no utility from public service delivery, but do enjoy public funds appropriation.

3.2.2 Timing

The timing of the game is then as follows.

1. Nature draws the incumbent politician type, $\tau \in \{h, c\}$.

2. The incumbent politician of type τ selects policy $\{g_1^\tau, s_1^\tau, r_1^\tau\}$ in period $t = 1$.

3. Voters observe g_1 and decide whether to reelect their incumbent politician, $v \in \{I, A\}$.

4. If an incumbent politician is not reelected, nature draws a new incumbent politician type in period two.

5. The (possibly new) incumbent politician selects $\{g_2^\tau, s_2^\tau, r_2^\tau\}$ in period $t = 2$.

6. All utilities are realized and the game ends.

3.2.3 Equilibrium without a certification program

In the absence of a certification program, and assuming that voters play their welfare-maximizing equilibrium, there is a unique perfect Bayesian equilibrium, whose outcome depends on the probability γ that the municipal incumbent is honest. The following Proposition 1 characterizes this equilibrium.

Proposition 1. *Assume that* $1 + \overline{\beta} > 2\underline{\beta}$ *and that voters play their welfare-maximizing equilibrium, and denote* $\gamma^* = \frac{\underline{\beta}}{1+\overline{\beta}-\underline{\beta}}$. *If* $\gamma \geq \gamma^*$, *corrupt incumbents choose policy vectors* $\{g_1^c, s_1^c, r_1^c\} = \{g_2^c, s_2^c, r_{,2}^c\} = \{0, 0, 1\}$, *honest incumbents choose policy vectors* $\{g_1^h, s_1^h, r_1^h\} = \{0, 1, 0\}$ *and* $\{g_2^c, s_2^c, r_2^c\} = \{1, 0, 0\}$, *and voters reelect their incumbent politicians in between period one and two upon observing* $g_1 = 0$. *If instead* $\gamma < \gamma^*$, *both incumbent types choose policy vector* $\{g_1, s_1, r_1\} = \{1, 0, 0\}$ *in period one, corrupt and honest incumbents respectively choose policy vectors* $\{g_2^c, s_2^c, r_2^c\} = \{0, 0, 1\}$ *and* $\{g_2^h, s_2^h, r_2^h\} = \{1, 0, 0\}$ *in period two, and voters always reelect their incumbent politicians in between period one and two. Voters' expected utility, before the realization of* τ, *is then given by:*

$$E\left[U\left(g_t, s_t\right)\right] = \begin{cases} \left(1+\gamma\right)\underline{\beta} & \text{if } \gamma < \gamma^*, \\ \gamma\left(1+\overline{\beta}\right) & \text{if } \gamma \geq \gamma^*. \end{cases}$$

Proof. See Appendix, where were also define the off-equilibrium strategies and beliefs that complete the characterization of the Perfect Bayesian equilibrium. □

Proposition 1 show that voters are willing to risk allowing corrupt politicians to appropriate resources in the first period to generate investments in state capacity that would increase overall public service delivery when the incumbent is honest. Intuitively, this occurs when the likelihood that their incumbent is honest is sufficiently high: $\gamma \geq \gamma^*$. Otherwise, voters only reelect incumbents that spend the entire budget into current public service delivery in period one. For ease of exposition, the following assumption restricts the characterization of the certification program to the empirically-relevant case where there is under provision of overall service delivery, because voters believe that the likelihood that their incumbent is honest is sufficiently low.

Assumption 2. $\gamma < \gamma^*$.

3.2.4 Equilibrium with a certification program

We next model the certification program as a third party that publicly certifies $a \in \{0, 1\}$ whether $s_1 = 1$ when $g_1 = 0$. Importantly, this third party is of two types, $\alpha \in \{H, C\}$. It is honest, $\alpha = H$, with probability ρ and corrupt, $\alpha = C$, with probability $1 - \rho$, and its type is only known to the municipal incumbent. Honest third parties report truthfully, $a = s_1$, but corruptible ones report $a = 1$ regardless.

Again assuming that voters play their welfare-maximizing equilibrium, there is a unique perfect Bayesian equilibrium where the outcome depends on the probability γ that the incumbent is honest and the probability ρ that the third-party that certifies state-capacity investments is honest. The following Proposition 2 characterizes this equilibrium.

Proposition 2. *Assume that* $1 + \overline{\beta} > 2\underline{\beta}$, $\gamma < \gamma^*$, *and that voters play their welfare-maximizing equilibrium, and denote* $\gamma^{**}(\rho) = \frac{\underline{\beta}-\rho}{(1+\overline{\beta}-\underline{\beta}-\rho)} < \gamma*$, *where* $\frac{\partial \gamma^{**}}{\partial \rho} < 0$. *If* $\gamma \geq \gamma^{**}(\rho)$, *municipal honest incumbents choose* $\{g_1^h, s_1^h, r_1^h\} = \{0, 1, 0\}$ *and* $\{g_2^h, s_2^h, r_2^h\} = \{1, 0, 0\}$, *corrupt politicians always chose* $\{g_2^c, s_2^c, r_2^c\} = \{0, 0, 1\}$ *in the second period and choose* $\{g_1^c, s_1^c, r_1^c\} = \{0, 1, 0\}$ *if the third-party is not corrupt* ($\alpha = H$) *and* $\{g_1^c, s_1^c, r_1^c\} = \{0, 0, 1\}$ *if the third-party is corrupt* ($\alpha = C$), *third parties always chose* $a = 1$ *and,*

only upon observing this, voters re-elect their incumbent politicians in between period one and two. If instead $\gamma < \gamma^{**}(\rho)$*, both types of municipal incumbent choose policy vector* $\{g_1, s_1, r_1\} = \{1, 0, 0\}$ *in period one, corrupt and honest incumbents respectively choose policy vectors* $\{g_2^c, s_2^c, r_2^c\} = \{0, 0, 1\}$ *and* $\{g_2^h, s_2^h, r_2^h\} = \{1, 0, 0\}$ *in period two, and voters reelect their incumbent politicians in between period one and two,* $v = 1$*. Voters' expected utility, before the realization of* τ*, is then given by:*

$$E[U(g_t, s_t)] = \begin{cases} (1+\gamma)\underline{\beta} & \text{if } \gamma < \gamma^{**}(\rho), \\ \gamma\left(1+\overline{\beta}\right) + (1-\gamma)\rho & \text{if } \gamma \geq \gamma^{**}(\rho). \end{cases}$$

Proof. See Appendix, where were also define the off-equilibrium strategies and beliefs that complete the characterization of the Perfect Bayesian equilibrium. □

Proposition 2 highlights that voters might benefit from the certification program, by transitioning to an equilibrium where both types make state capacity investments in the first period, only when the likelihood that both their incumbent and the third-party are honest is sufficiently high: $\gamma \geq \gamma^{**}(\rho)$. Otherwise, voters continue only to reelect incumbents that spend the entire budget into current public service delivery in period one, thereby selecting an equilibrium that discourages state capacity investments.

3.2.5 Effects of the certification program

We next turn to the empirically testable implications of the model, with Proposition 3 demonstrating that, while the average effect of the certification program of voter utility or overall service delivery in certified municipalities should be non negative, it should be decreasing in the likelihood that the certifying third parties are corrupt and lower for corrupt, as opposed to honest, incumbents.

Proposition 3. *The expected change in overall service delivery in municipalities where state capacity investments are certified,* $a = 1$*, is given by:*

1. *Non negative,*

$$E\left[U\left(g_t, s_t\right)|a=1\right] - E\left[U\left(g_t, s_t\right)|a=0\right] = \gamma\left(1+\overline{\beta}\right) + (1-\gamma)\,\rho - (1+\gamma)\,\underline{\beta} \geq 0,$$

2. *Increasing with* ρ*,*

$$\frac{\partial E\left[U\left(g_t, s_t\right)|a=1\right] - E\left[U\left(g_t, s_t\right)|a=0\right]}{\partial \rho} > 0,$$

and

3. *Lower for* $\tau = c$*, as opposed to* $\tau = h$*,*

$$E\left[U\left(g_t, s_t\right)|c=1, \tau=c\right] - E\left[\Delta U\left(g_t, s_t\right)|c=1, \tau=h\right] < 0.$$

Proof. See Appendix. □

The result in Proposition 3 indicates that certification by a third-party auditor leads to an increase in service delivery, on average. However, this effect masks the important redistributive consequences of certifying municipalities. In particular, its effect on overall service delivery is smaller in municipalities where third parties are likely to be corrupt, since third parties allow corrupt incumbents to claim that they are investing in state capacity but actually appropriate public funds; absent the certification program, they would have had to invest entirely in public service delivery in period one to get reelected. In contrast, third parties that are honest do not allow for this behavior by corrupt incumbents, who then do need to invest in state capacity to get re-elected. Similarly, the effect on overall service delivery is smaller in municipalities with corrupt incumbents than with honest incumbents. This result follows for various reasons. First, as just explained, the effect in municipalities with corrupt incumbents certified by corrupt third parties should be negative. Moreover, the effect is also negative in those municipalities, even when third parties are honest because investments in state capacity are inefficient given that corrupt incumbents appropriate all

public funds in the second period, and thus voters would have been better off with all public fund being invested in public service delivery in period one. Lastly, the effect on overall service delivery is positive in municipalities with honest incumbents since these are able to efficiently invest in state capacity to increase overall service delivery to voters.

3.3 Background

3.3.1 Mexican municipal governments and their poor institutional capacity

Mexico's federal system is divided into 31 states (and the Federal District of Mexico City), which contain around 2,500 municipalities. Municipalities are governed by mayors who are typically elected to three-year non-renewable terms.[1] Following major decentralization reforms in the 1990s (see Wellenstein, Núñez, and Andrés 2006), municipal governments—the focus of this article—became the main responsible for the day-to-day provision of basic local infrastructure and local public services. These include local policing, roads, sewerage, and water. Municipalities also assist state and federal governments in the provision of other public services including elementary education, health services, and environmental protection, among others.

However, while the decentralization reforms contributed to a significant increase in expenditure authority of municipalities, they were not accompanied by a corresponding promotion of tax collection responsibilities. Spending by municipal governments accounts for 20% of total government spending, yet municipalities continue to be funded primarily by formula-based transfers from federal and state governments. The fiscal capacity of municipal governments to raise their own resources has actually declined over time relative to federal and state transfers: while municipalities raised 39% of their own revenues in the 1990s, this had declined to less than 20% by 2010 (Castañeda and Pardinas 2012).

In part due to the lack of capacity to generate revenues, Mexican municipalities often

[1] Re-election is possible for incumbents in some states starting in 2018.

also lack the institutional capacity to effectively deliver basic public services and manage local infrastructure. With the exception of large urban municipalities, most lack procedures for the provision and management of local public services, have low tax-collection capacity, lack trained officials, and are reluctant to politicize their administrative functions, among other things (Pérez Archudia and Arenas Aréchiga 2012). This situation significantly deteriorated with the escalation of drug trade-related violence in Mexico since 2007 (Dell 2015; Durante and Guitérrez 2015). According to the head of legal affairs at the Interior Ministry (Secretaría de Gobernación, SEGOB), 75% of Mexican municipalities are susceptible to infiltration and corruption by organized crime since they have little or no tools to combat criminal influence.[2] The institutional weakness of municipal governments is highlighted by both government officials and researchers as the underlying cause for the spread of organized crime (Aguirre and Herrera 2013).[3]

3.3.2 The *From the Local Agenda* program

The *From the Local Agenda* (Agenda desde lo Local, ADL) program, which is now called the Municipal Development Agenda (Agenda para el Desarrollo Municipal, ADM),[4] was motivated by the desire to strengthen municipal state capacity, improve service delivery, and ultimately facilitate local development. The ADL program specifically aimed to support sustained and inclusive municipal economic and environmental development. The program has been administered in Mexico since 2004 by the Interior Ministry through the National Institute for Federalism and Municipal Development (Instituto Nacional para el Federalismo y el Desarrollo Municipal, INAFED). The INAFED developed and implemented the ADL

[2]See InSight Crime, "75% of Mexico Municipalities Susceptible to Organized Crime: Official," January 23rd 2015.

[3]According to the Minister of Interior this institutional weakness is behind the spread of organized crime. See SinEmbargo, "Osorio Chong reconoce que hay "debilidad" institucional en municipios," February 13th 2015.

[4]In 2014 the ADL program was revised and modified to include more aspects related with the role of municipal authorities in economic and social development, as well as environmental sustainability. See `http://www.agendaparaeldesarrollomunicipal.gob.mx/`.

program in line with Agenda 21, an action plan of the United Nations designed to promote sustainable economic, social, and environmental development in the 21st Century.[5]

The INAFED has implemented the ADL program together with, and largely through, state governments. Participation by municipal governments is voluntary. The program consists of four stages: self-diagnosis, third-party verification, improvement in under-performing areas, and update and certification. In the first stage of the program, municipal governments—aided by state governments—self-diagnose their institutional capacity for service delivery and actual service delivery. Specifically, they assess their capacities and performance across 39 indicators, including 270 separate sub-indicators, which are grouped into four areas: (1) institutional capacity for good governance; (2) sustainable economic development; (3) inclusive social development; and (4) sustainable environmental development. During the self-diagnosis stage, municipal governments assign themselves a red (completely undesirable situation and dramatic room for improvement), yellow (some room for improvement), or green (acceptable situation) status for each indicator and sub-indicator based on the sub-indicator specific guidelines stipulated by INAFED.

In the second stage of the program, the self-diagnosis by municipal governments is subject to third-party verification, usually arranged by state governments. The third parties have to be institutions of higher education, usually public or private local universities or institution of tertiary education. The use of these institutions was supposed to ensure that verification was perceived as neutral and objective by government officials and citizens. However, the credibility of such institutions is challenged by the fact that institutions of higher education are largely funded by the federal and state governments. Especially when there is alignment between the incumbent parties at the municipal and state levels, governors may seek to manipulate third-party certification to benefit the reputation of their co-partisans and that of their party more generally. Moreover, there are countless instances of staff, including

[5]This is a product of the United Nations Conference on Environment and Development, also known as Earth Summit, held in Rio de Janeiro, Brazil, in 1992. Section 3 and chapter 28 of the Agenda 21 embody the well-known Local Agenda 21 stating that local authorities are essential to promote sustainable development. See `https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf`.

faculty and students, from institutions of higher education engaging in corruption.[6] A recent corruption scandal resulting in the diversion of approximately USD 400 million of public funds involves the federal government and eleven institutions of higher education, four of which worked as third party verifiers: Universidad Autónoma del Estado de México, Universidad Autónoma del Estado de Morelos, Universidad Politécnica del Golfo de México, and Universidad Tecnológica de Tabasco.[7]

The faculty and students from those institutions who act as verifiers receive training on indicators and corresponding criteria to be examined. They are responsible for reviewing the supporting documentation provided by municipal governments and validating their self-diagnosis for each indicator.[8] Where verification worked best, auditor accounts still frequently indicated concerning flaws in the process, including instances of municipalities receiving a high status along many indicators and municipal officials selectively providing evidence to support each subindicator status. In many cases, the verification team simply had to trust the information provided by officials without being able to examine the self-diagnosis in greater detail or even look at the original data (Turrubiates Flores, Vargas Cuéllar, and Suárez Rodríguez 2014).

In 2017, 1,164 municipalities in 30 states participated in the program, but only 863 concluded the verification process.[9] 1,827 individuals—including faculty and students—from 163 institutions of higher education verified the self diagnosis done by municipal governments. Out of these 163 institutions, 99 (61%) are universities, 57 (35%) technological institutes, 5 (3%) local colleges, and 2 (1%) higher education institutes. The mean institu-

[6]For an example of the latter, Educación Futura, "Corrupción en un instituto tecnológico," February 11th 2016 shows evidence that acceptance to the Technological Institute of Querétaro (Instituto Tecnológico de Querétaro, ITQ) was sold for USD 1,000 and faculty modified grades for USD 50 or sexual favors.

[7]See NYT, "'El dinero se iba a un agujero negro:' el esquema de corrupción que compromete al gobierno de México," September 5th 2017 for more details.

[8]See the INAFED website for more details.

[9]These numbers exclude the municipalities which had all their indicators certified, as well as those which did not re-register into the program.

tion conducted slightly more than 5 verifications, while the median conducted 3.[10]

In the third part of the program, after identifying areas for improvement in diverse aspects of their administration, municipal governments—again aided by state governments—produce and execute plans to strengthen municipal state capacity and improve service delivery. These plans focus particularly on the indicators which were assigned a red status, and often include the training of municipal officials by state governments. To reflect improvement in these areas, municipal officials then reassess their self-diagnosis, which is again subject to third-party verification.

In the fourth stage of the program, the From the Local National Council (Consejo Nacional Desde lo Local)—which is formed by representatives from the federal and state governments, as well as representatives from institutions of higher education—grants certificates to municipal government for each indicator that is deemed as green. These certificates are handed out by federal and state officials in award ceremonies, which are widely publicized by municipal governments and local media. These usually highlight not only the great work of municipal government officials, but the fact that results are subject to third-party auditing by local higher education institutions. It is also often mentioned that the municipal governments are certified using international standards.[11]

3.4 Empirical implications

We next apply the empirical implications of the theoretical model in section 3.2 to the context of the ADL program just described. We note two issues when bringing the model to the data. First, the ADL program certified the status of municipal government capacity and service delivery on a three-point scale ranging from a completely undesirable situation (red) to an acceptable situation (green). Our simplified model, however, only captures a red or yellow versus a green comparison. Second, and more importantly, while the model

[10]See the INAFED website for more details.

[11]Tribuna de la Bahía, "Aprueba Puerto Vallarta los 270 indicadores de la Agenda para el Desarrollo Municipal," October 18th 2016.

distinguishes between investments in state capacity from service delivery, this distinction is far from clear across the indicators certified within the ADL program. As a result, we focus on the empirical predictions on overall service delivery, as captured by voter utility in the theoretical model.

We begin with two hypotheses regarding the impact of being certified by the ADL program—that is to say receiving a certification of any status—on the extent to which municipal governments receive a higher status certification. These predictions, captured by Hypotheses 1 and 2, follow intuitively from an extension of the simple theoretical model in Section 3.2 to allow for a scale-, as opposed to discrete-, status certification.

Hypothesis 1 naturally follows from the nature of the program.

Hypothesis 1. *There is an increase in the status certified over time of the municipalities certified within the program.*

As our Section 3.3 suggests, the dependence of local universities on state government funding makes them susceptible to corruption as certifying third parties. We thus proxy for the likelihood that the third party certifying a municipal government is corrupt with whether a given municipal government is politically aligned with the state government. We then expect certified municipalities that are politically aligned to receive a higher status certification over time than those unaligned.

Hypothesis 2. *The over-time increase in the status certified is larger for municipalities politically aligned with the state government.*

We next focus on three hypotheses concerning the impact of being certified by the ADL program on the overall service delivery of municipal governments. First, Hypothesis 3 follows from Proposition 3.1:

Hypothesis 3. *Being certified by the ADL program has a non-negative effect on a municipality's overall public service delivery.*

Then, again leveraging whether the municipal government is politically aligned with the

state government as a proxy for the likelihood that the third party certifying a municipal government is corrupt, Hypothesis 4 follows from Proposition 3.2.

Hypothesis 4. *The effect of being certified by the ADL program on a municipality's overall public service delivery is lower for municipalities politically aligned with their state government.*

Lastly, since the theoretical model highlights that corrupt municipal incumbents should be associated with a lower overall public service delivery, we denote municipalities with corrupt incumbents as those with low baseline levels of certification upon entry into the program. While imperfect, this is a reasonable proxy for underlying corruption. Hypothesis 5 then follows from this definition and Proposition 3.3.

Hypothesis 5. *The effect of being certified by the ADL program on a municipality's overall public service delivery is lower for municipalities whose certification status upon entry into the program is low.*

3.5 Research design

We next explain our identification strategy and how it allows us to test the empirical predictions of the model synthesized in the hypotheses enumerated in section 3.4, before describing the data that underpins it.

3.5.1 Identification strategy

To identify the effects of certification within the ADL program on state capacity outcomes, we exploit the staggered certification of Mexican municipalities that enroll in the ADL program using a generalized difference-in-differences design. Specifically, we examine the effects of a municipality being certified on certification status, as well as a range of state capacity and public service delivery measures, in the years prior to being certified to the years after, relative to municipalities that were certified at an earlier or later date. Given

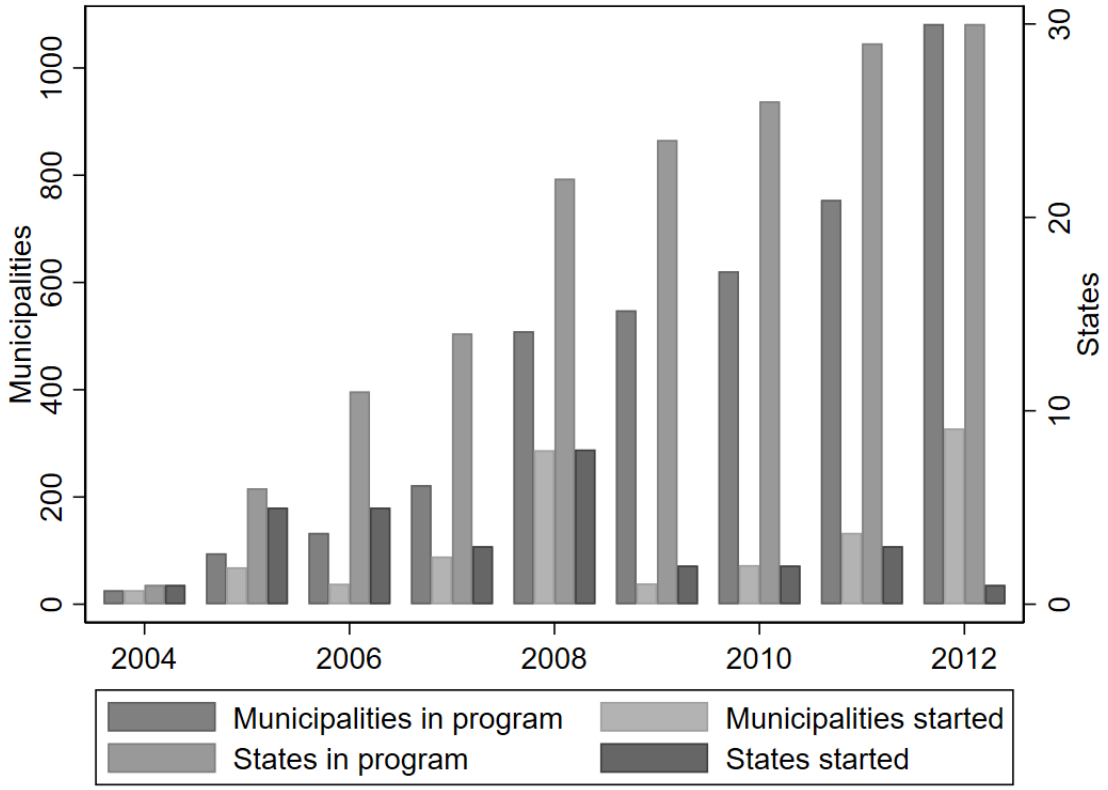


Figure 3.1: Stocks and flows of municipalities participating in the ADL program

Notes: This plot shows the total number of municipalities participating in each year of the program as well as the number of municipalities that started the program in a given year.

that many outcomes cannot be feasibly altered within months of joining the program, we define post-certification years starting with the year that certification results were first released for the municipality. Figure 3.1 shows the number of participating municipalities over the years of the program and the number of states that have municipalities participate in the program. Participation in the program seems to be driven to a large part on the state level with multiple municipalities from a given state joining at the same time. Figure 3.1 reveals that the number of municipalities that enter the program is correlated with states entering.

To test Hypothesis 1, which states that certified status should increase over time for the

municipalities certified within the program, we estimate the following specification:

$$Y_{imt} = \beta_1 Program_{mt} + \eta_{its} + \theta_{im} + \epsilon_{imt}, \tag{3.1}$$

where Y_{imt} is the certified status for indicator i in municipality m in year t, and $Program_{mt}$ is an indicator for whether municipality m has been certified within the program by year t or not. We also include state-indicator-year fixed effects, η_{its}, and municipality-indicator fixed effects, θ_{im}, to capture the difference-in-differences design, and thus absorb all common shocks that could differ by state-indicator and time-invariant municipality-indicator characteristics. We cluster at the municipality level throughout. The main coefficient of interest is β_1, which estimates the effect of program certification.

Hypothesis 2 predicts that the over-time increase in the status certified should be larger for municipalities politically aligned with the state government. We test this prediction by estimating the following specification:

$$\begin{aligned} Y_{imt} \quad = \quad & \beta_1 Program_{mt} + \beta_2 (Program_{mt} \times 1[State\ Alignment_{tm} = 1]) \\ & + \eta_{its} + \eta'_{its} 1[State\ Alignment_{tm} = 1] + \theta_{im} \\ & + \theta'_{im} 1[State\ Alignment_{tm} = 1] + \epsilon_{imt}, \end{aligned} \tag{3.2}$$

where $State\ Alignment_{tm}$ indicates whether the party that governs the municipality also governs the state. The coefficient on β_1 estimates the effect of program certification on municipalities that are not aligned with the state government, while the coefficient on β_2 captures the differential effect of program certification for those municipalities aligned with the state government. The fixed effects are interacted with state alignment in order to exploit only variation within aligned and unaligned municipalities when estimating the effects of being certified.

To test Hypothesis 3, which predicts a non-negative effect of program certification on overall public service delivery, we estimate the same specification as in equation 3.1 but

we consider actual public service delivery, independently measured from the program (more details in Section 3.5.2, as an outcome instead. Similarly, we test Hypothesis 4, which predicts that such an effect should be lower for municipalities politically aligned with their state government, by estimating Equation 3.2 but actual public service deliver an outcome instead.

Hypothesis 5 predicts that the effect of being certified by the ADL program certification on overall public service delivery should be lower for municipalities whose certification status upon entry into the program is low. We test this prediction using the following specification:

$$\begin{aligned} Y_{imt} &= \beta_1 Program_{mt} + \beta_2 (Program_{mt} \times 1[LowBaseline_m = 1]) \\ &\quad + \eta_{its} + \eta'_{its} 1[LowBaseline_m = 1] + \theta_{im} + \epsilon_{imt}, \end{aligned} \tag{3.3}$$

where $LowBaseline_m$ indicates whether the municipality received a low certification on a given indicator in the first year of being certified in the program. The benchmark coefficient, β_1, estimates the effect of program on municipalities certified as having the highest status when entering the program. The coefficient on β_2, in turn, captures the differential effect of program certification when municipal incumbents receive a low certification status upon entry into the program.

We require a parallel trends assumption to plausibly identify the effects of the certification program on outcomes. Specifically, this entails that municipalities that enter the program earlier would have otherwise followed the same trend as municipalities that entered the program later. Common approaches to test for this assumption are to: (i) conduct an event study plot by running the following specification; and (ii) formally test the parallel trends assumption by including k of leads of $Program_{mt}$ according to specifications of the following form

$$Y_{imt} = \sum_{\tau=0}^{k} \beta_{1\tau} Program_{mt+\tau} + \eta_{it} + \theta_{im} + \epsilon_{imt}, \tag{3.4}$$

where $Program_{mt+\tau}$ is an indicator for municipality m being certified within the program τ years into the future. We use up to 3 leads (i.e. $k = 3$).

3.5.2 Data

Data on participation in the ADL program and the certifications come from the website of the National Institute for Federalism and Municipal Development (INAFED).[12] The data allows us to know which municipalities participated in a given year between 2004, the first year of the program, and 2013—the last year before the program switched name and slightly altered its implementation. INAFED also provide the certified status that each municipality received in each of the 39 program indicators.

Data on state capacity and public service delivery outcomes, which are associated with the 39 indicators certified within the ADL program, comes from three sources, which are independent of the program and vary in the years in which they are available. First, we use an original data set on municipal state capacity and service delivery. Between 2000 and 2013, the National Institute of Statistics and Geography (Instituto Nacional de Estadística y Geografía, INEGI) surveyed municipal governments 6 times. Using this data we were able to measure municipal institutional capacity and service delivery over time. For each survey wave, we have detailed measures of every municipality's personnel (by age, education, and department), resources (number of computers, vehicles, etc.), public good provision, existence of regulations, and more. As far as we are aware, this panel data set is the first of its kind, since local governments are rarely surveyed repeatedly in such detail. It is ideal for this study as it allows us to investigate changes in institutional capacity and public service delivery over time as a consequence of program certification. Importantly, the INEGI was not involved in the ADL program at any stage and surveyed municipal governments independently from ADL program activities. For each indicator, we study the sub-indicator used to evaluate the municipalities and link them to outcome variables in our data set. In many cases, we are able to find exact matches with the evaluation criteria of the program.

[12] https://www.gob.mx/inafed/acciones-y-programas/resultados-historicos-del-programa-agenda-desde-lo-local

We are then able to code whether a municipality actually satisfied the conditions to obtain red, yellow, or green for a given sub-indicator.

Second, some certification indicators relate to municipal finances (see 1.1, 1.5, 1.11 in Table 3.1). The municipal public finance data published by the INEGI provides detailed information on many of the outcomes of the finance sub-indicators.[13] Third, since one indicator is related to housing (see 3.8 in Table 3.1) and several others to public service delivery to Mexican households, we exploit information from the quinquennial population census conducted by the INEGI.[14] Specifically, we use information on the extent to which households have access to the electricity, sewage, and water grids, as well as the quality of their dwelling (e.g., floor, roof, and wall material) and extent of overcrowding, which overlap closely with several sub-indicators contained in the ADL program. As with the municipal survey data, the municipal public finance and census data are collected independently from ADL program activities.

[13]See more details in the INEGI website.

[14]See more details in the INEGI website.

Table 3.1: Summary Statistics by Indicator

Indicator	Variable	Mean	Standard Deviation	Min	Max
1.1	Percentage women of total employees	0.27	0.10	0.00	0.87
	Does the mun. have an evaluation sector?	0.26	0.44	0.00	1.00
	Percentage of administrative personnel of total employees	0.67	0.18	0.00	1.00
	Own income / Current expenditure	0.47	0.50	0.00	11.87
	Current expenditure / Total expenses	0.71	0.10	0.11	1.00
	Public investment / Total income	0.30	0.16	0.00	1.00
	Personal services / Current expenditure	-1.20	0.72	-37.13	-0.00
	Total expenses + Total revenue	0.13	0.27	-3.10	5.21
1.2	Partnership with other municipalities	0.32	0.47	0.00	1.00
	Contributions to intermunicipal agreements	0.40	0.96	0.00	6.00
1.4	Sector for promoting social participation?	0.30	0.46	0.00	1.00
	Participation of commissions and/or communal committees	0.33	0.47	0.00	1.00
	Index for regulations for participation	0.10	0.42	0.00	2.00
	Are there mechanisms for citizens participation?	0.84	0.37	0.00	1.00
1.5	Whether the collection of property tax is done by mun.	0.94	0.20	0.00	1.00
	Update of property values in the last 2 years	0.73	0.44	0.00	1.00
	Own income / Total income	0.12	0.12	0.00	1.00
	Public debt / Total expenses	0.96	0.05	0.19	1.00
	Changes in property tax	2.51	82.08	0.00	7,907.05
	Changes in Derechos + Productos + Aprovechamientos	1.68	12.17	0.00	970.34
1.6	Is there a plan for civil protection?	0.72	0.45	0.00	1.00
	Is there a map of risk zones?	0.49	0.50	0.00	1.00
	Index for regulations on civil protection	0.36	0.75	0.00	2.00
1.7	Total number of computers / total number of employees	0.19	0.17	0.00	1.00
	Does the municipal office have an Internet connection?	0.71	0.45	0.00	1.00
1.8	Is there a juridica?	0.69	0.46	0.00	1.00
	What percentage of sectors have regulations	0.40	0.30	0.00	1.00
	Index of regulations	0.50	0.77	0.00	2.00
1.9	Is there a justice office?	0.55	0.50	0.00	1.00
	Is there a juridica?	0.69	0.46	0.00	1.00
1.10	Institution responsible for transparency?	0.56	0.33	0.00	1.00
	Regulations to regulate access to public info.?	0.54	0.50	0.00	1.00
	Public servants responsible for public info.?	0.67	0.47	0.00	1.00
	A system of reception of and attention to public info. requests	0.53	0.50	0.00	1.00
	A system for archives	0.32	0.47	0.00	1.00
	Training program for public servants on public info.	0.33	0.47	0.00	1.00
	Is there open access?	0.85	0.36	0.00	1.00
	Are there regulations about transparency?	0.38	0.48	0.00	1.00
	Observations	14,898			

This table shows summary statistics for the outcome variables used for each indicator. Variables with extreme outliers are winsorized in the main analysis.

Table 3.2: Summary Statistics by Indicator Continued

Indicator	Variable	Mean	Standard Deviation	Min	Max
1.11	Debt accumulated from previous years	-2.27	6.66	-21.43	2.30
	Percentage of budgeted contributions collected (Ordinal)	2.73	1.33	1.00	5.00
	Federal participations / Total income	0.55	0.16	0.00	1.00
2.1	Is there someone responsible for economic development?	0.49	0.50	0.00	1.00
	Are there regulations for economic development?	0.25	0.44	0.00	1.00
3.1	Percentage of mun. capital covered by drainage and sewage	0.79	0.27	0.00	1.00
	Percentage of rest of mun. covered by drainage and sewage	0.52	0.34	0.00	1.00
	Percentage of mun. capital covered by public lighting	0.82	0.25	0.00	1.00
	Percentage of rest of mun. covered by public lighting	0.63	0.32	0.00	1.00
	Percentage of mun. capital covered by street cleaning	0.81	0.27	0.00	1.00
	Percentage of rest of mun. covered by street cleaning	0.59	0.35	0.00	1.00
	Percentage of mun. capital covered by trash collection	0.85	0.24	0.00	1.00
	Percentage of rest of mun. covered by trash collection	0.62	0.34	0.00	1.00
	Are there grave regulations?	0.42	0.49	0.00	1.00
	Are there market regulations?	0.41	0.49	0.00	1.00
3.2	Do regulations on performance and sport exist?	0.35	0.48	0.00	1.00
	Index for regulations on performance and sport	0.24	0.64	0.00	2.00
3.6	Percentage of mun. capital covered by drinking water	0.84	0.22	0.00	1.00
	Percentage of rest of mun. covered by drinking water	0.64	0.31	0.00	1.00
	Percentage of mun. capital covered by drainage and sewage	0.79	0.27	0.00	1.00
	Percentage of rest of mun. covered by drainage and sewage	0.52	0.34	0.00	1.00
3.8	Percentage of mun. capital covered by drinking water	0.84	0.22	0.00	1.00
	Percentage of rest of mun. covered by drinking water	0.64	0.31	0.00	1.00
	Percentage of mun. capital covered by drainage and sewage	0.79	0.27	0.00	1.00
	Percentage of rest of mun. covered by drainage and sewage	0.52	0.34	0.00	1.00
	Occupants in homes with drainage and / or toilet	0.89	0.13	0.20	1.00
	Occupants in homes with electric power	0.95	0.08	0.10	1.00
	Occupants in houses with dirt floor	0.85	0.16	0.04	1.00
	Housing without overcrowding	0.53	0.13	0.14	0.89
	Observations	14,898			

This table shows summary statistics for the outcome variables used for each indicator. Variables with extreme outliers are winsorized in the main analysis.

Table 3.3: Summary Statistics

	Mean	Standard Deviation	Min	Max
Program Start Year	2009	2.59	2004	2013
Program	0.35	0.48	0.00	1.00
Low baseline	0.78	0.42	0.00	1.00
Intensity	1.46	0.83	0.00	2.00
Aligned with State	0.58	0.49	0.00	1.00
Observations	125126			

These three data sources produce 67 variables that link closely with 15 of the ADL program's 39 indicators. Table C.3 in the appendix explains, for each indicator, which variables we use as outcomes, what data source they are from, and how they are coded. Table 3.1 shows the summary statistics for all outcome variables by indicator. For the analysis, the variables for each indicator are combined into a z-score.

3.6 Results

We begin by briefly showing that the certified status that municipalities receive is increasing over time and that this effect is larger when the municipal incumbent is politically aligned with the state government. Our main contribution, however, is to focus on the *actual metrics* of state capacity and public service delivery that we can measure independently from the program, which in principle should underpin the certified status but may in practice differ radically if the ADL certification program is corrupted. When we examining these actual performance outcomes, we find that participation in the program generally does not increase municipalities' performance on governance outcomes related to program indicators. We then show that, consistent with the empirical predictions of our theoretical model, overall public service delivery of certified municipalities decreases with the political alignment of the municipal and state governments, and that the effect of the program on public service delivery of certified municipalities is weaker in places with low initial certified status.

3.6.1 Effect of the ADL program on certified status over time

We first examine Hypotheses 1 and 2 concerning the effect of being certified by the program on the certified status of participating municipalities. Table 3.4 shows the results of estimating equation (3.1), where the outcome is an ordinal scale for whether a municipality was certified as green (coded as 3), yellow (coded as 2), or red (coded as 1). Column (1) focuses on all program indicators, while columns (2) and (3) restrict to the indicators for which we have independent state capacity and public service delivery measures. Consistent with Hypothesis 1, columns (1) and (2) indicate that the program led to a substantial increase in the certified status over time among participating municipalities. The effect in column (2) is sizable, with the certification status increasing on average by 6% over the time of the program. Figure 3.2 illustrates this effect graphically over the duration of a municipality's post-certification participation in the program.[15]

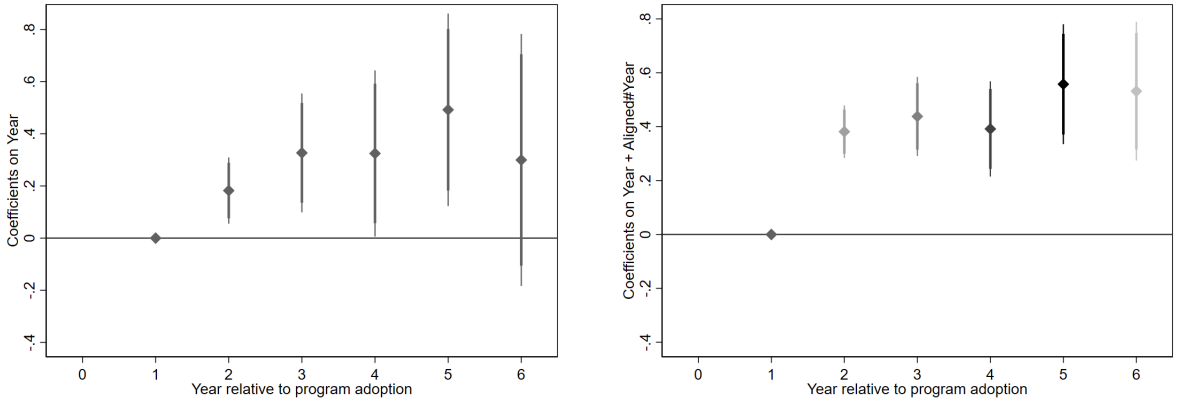
Column (3) in Table 3.4 shows heterogeneous effects by political alignment between the municipal and state governments, which recall we use as a proxy for the likelihood of corruptibility of the certifying third party. Consistent with Hypothesis 2, the results support that the effect estimated in column (2) is increasing with such an alignment. While the effect is marginally statistically insignificant, it is sizable. Namely, the effect of the program is 67% larger in municipalities politically aligned with the state government. Figure 3.3 shows graphically the effects of the program on the certified status of the program indicator by year since the year of program adoption. The plot on the left depicts the effect for municipalities not politically aligned with the state government, while the plot on the right portrays the differential effect for municipalities politically aligned with the state government.

[15]Note that we are unable to include the values prior to the municipal adoption of the program in Figure 3.2 since, naturally, there are no certification outcomes before that.

Table 3.4: Average Effect on Certified Status and Heterogeneous Effects by State Alignment

	(1) All Indicators	(2) Our Indicators Only	(3) Our Indicators Only
Program	0.0600***	0.107***	0.0646*
	(0.0136)	(0.0183)	(0.0377)
Program × Aligned with State			0.0435
			(0.0438)
Observations	544900	115625	109237
R^2	0.832	0.822	0.857
Mean of Outcome	1.725	1.732	1.732
SD of Outcome	0.913	0.914	0.913
Min of Outcome	1	1	1
Max of Outcome	3	3	3
Program + Program × Aligned			0.108***
			(0.0249)

Notes: This table shows the regression results of the main specification using program certification as outcomes. An observation represents a program indicator in a municipality in a year. The main independent variable, *Program*, is an indicator variable that equals one for each year after the municipality has entered the program. The specification includes state-year-indicator and municipality-indicator fixed effects. Column (1) uses the certification status for all indicators of the program. Column (2) restricts to indicators for which we have independent measures. Column (3) also uses the restricted sample and adds an interaction term of whether the municipality is governed by the same party as its state. Note that the fixed effects in column (3) are also interacted with the state alignment. Standard errors, clustered at the municipality level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$



Panel A: Effect for Unaligned Municipalities

Panel B: Differential Effect for Aligned Municipalities

Figure 3.3: Average Effect on Certified Status and Heterogeneous Effects by State Alignment

Notes: This figure shows the coefficients and confidence intervals of a regression of certified status on the year since a municipality entered the program interacted with state alignment. The sample includes each of the indexes for which we have measures constructed with data collected independently from the program. The specification includes state alignment-state-year-indicator and state alignment-municipality-indicator fixed effects. Panel (A) shows the coefficients on year since program start. Panel (B) shows the coefficients on year since program start *times* whether the municipality is governed by the same party as its state.

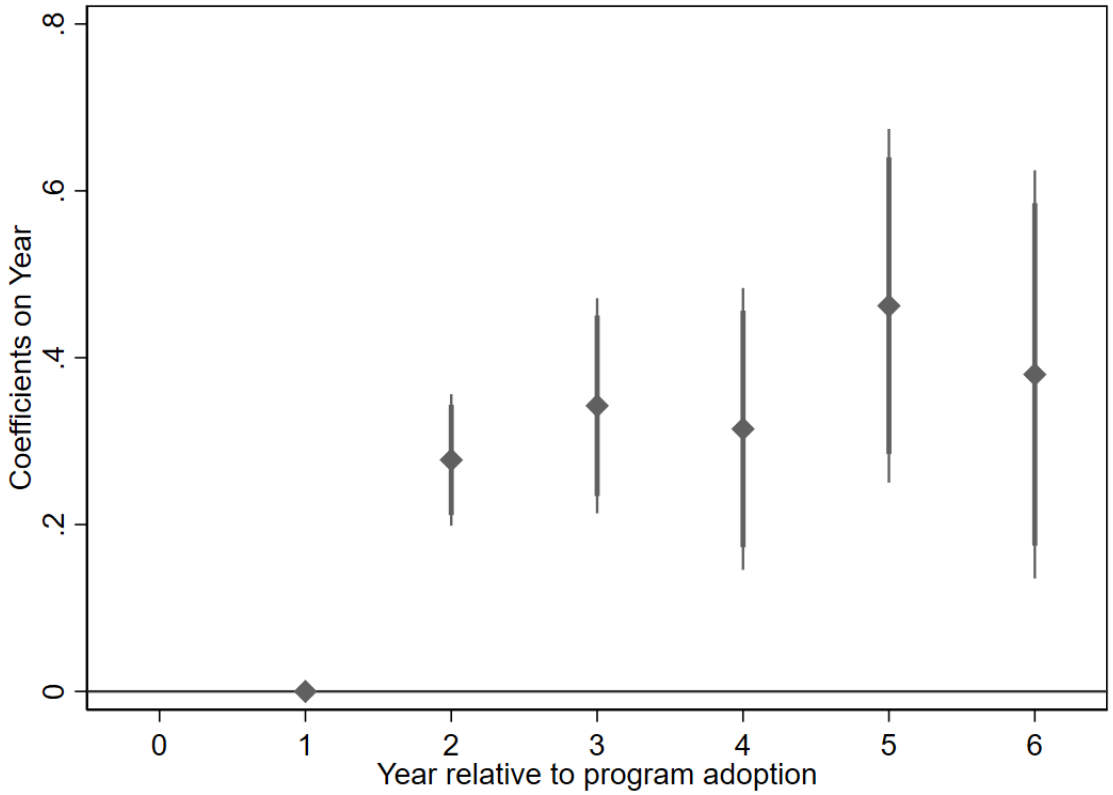


Figure 3.2: Average Effect on Certified Status

Notes: This figure shows the coefficients and confidence intervals of a regression of certified status on the year since a municipality entered the program. The sample includes each of the indexes for which we have measures constructed with data collected independently from the program. The specification includes state-year-indicator and municipality-indicator fixed effects.

3.6.2 Effect of the ADL program on state capacity and public service delivery

We next assess the effect of program certification on state capacity investments and public service delivery to test Hypotheses 3, 4, and 5. Figure 3.4 shows the results. *A priori*, the lack of an average positive effect could be considered inconsistent with Hypothesis 3, and consequently our theory. However, we note that the expected positive effect of being certified is expected to be small when the likelihoods of corrupt certifying third parties and municipal incumbents are high (i.e. ρ and γ are small, in the context of the model) and our

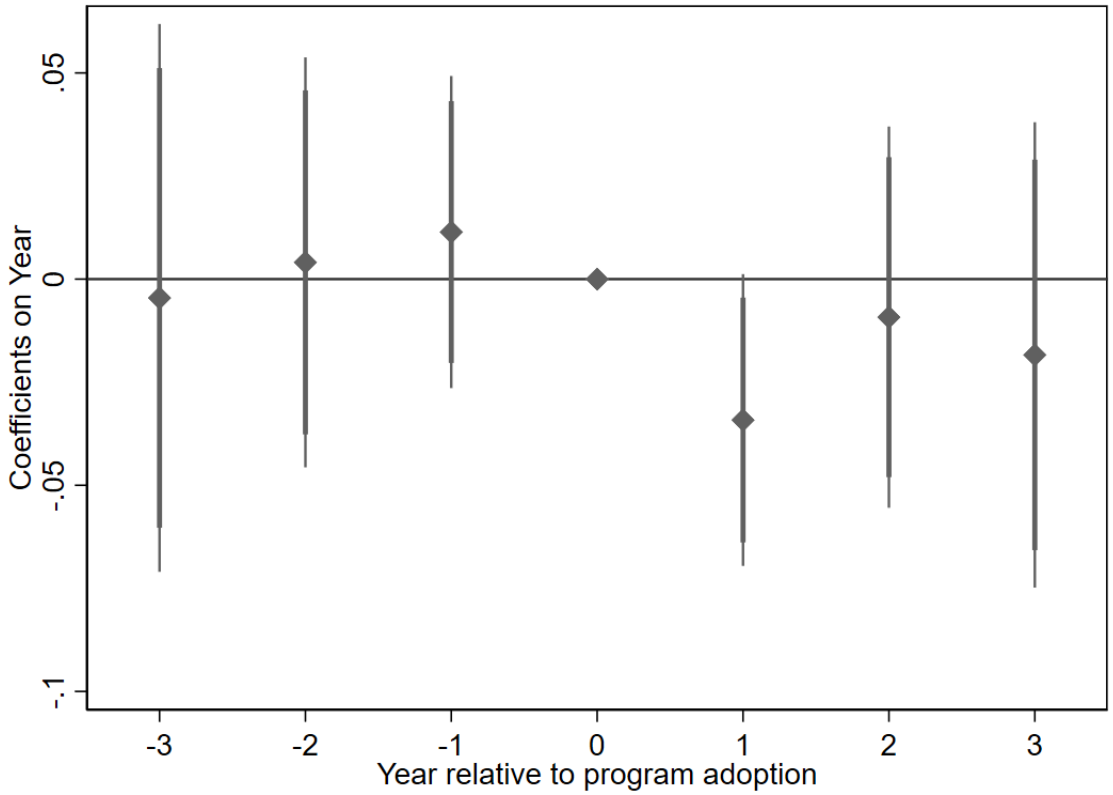


Figure 3.4: Average Effect on Public Service Delivery

Notes: This figure shows the coefficients and confidence intervals of a regression of overall public service delivery on the year since a municipality entered the program. The specification includes year-indicator-state and municipality-indicator fixed effects.

specification includes state-year-indicator fixed effects for causal identification, which might capture part of the average effect of the program of certifying indicator. Moreover, all other empirical predictions of the model are supported by the data.

Table 3.5 considers two interactions with program certification. Column (1) reports the results on the interaction with political alignment between municipal and state governments, which Table 3.4 suggests is a reasonable proxy for the corruptibility of the certifying third parties. Consistent with Hypothesis 4, these results indicate that overall public service delivery of certified municipalities significantly decreases with state alignment. This effect can also be seen graphically in Figure 3.5, which reports the effects of the program on

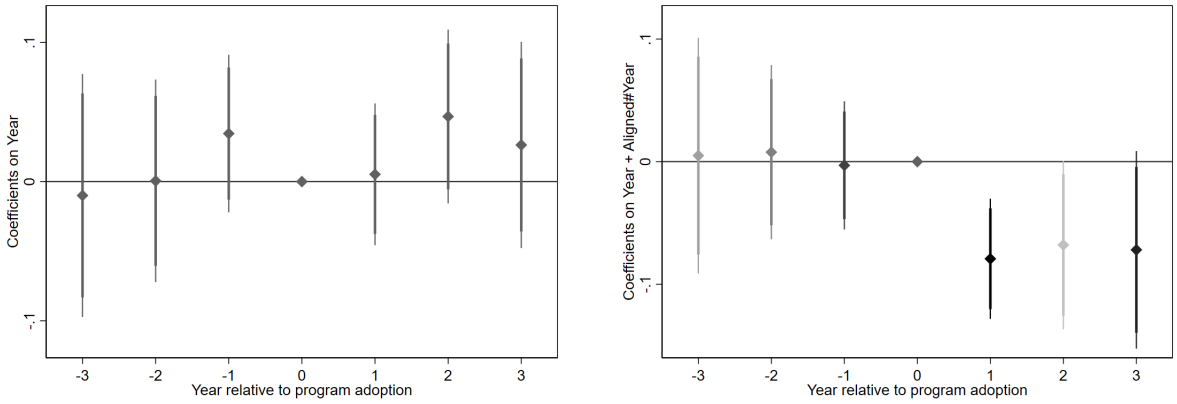
overall public service delivery of certified municipalities by year since the year of program adoption. The plot on the left depicts the effect for municipalities politically not aligned with the state government, while the plot on the right shows the differential effect for municipalities politically aligned with the state government. Figure 3.5 also supports the absence of differential pre-trends in the overall public service delivery of municipalities that become certified earlier relative to those becoming certified later for both municipalities not aligned with the state government and municipality aligned.

Table 3.5: Interactions with State Alignment and Low Baseline Certification

	(1) Z-Score	(2) Z-Score	(3) Z-Score
Program	0.0197	0.0544	0.0443
	(0.0225)	(0.0352)	(0.0524)
Program × Aligned with State	-0.0841***		-0.0210
	(0.0317)		(0.0756)
Low baseline × Program		-0.0837**	-0.0135
		(0.0366)	(0.0552)
Low baseline × Program × Aligned with State			-0.105
			(0.0789)
Observations	119310	123910	116490
R^2	0.514	0.444	0.540
Mean of Outcome	0.00708	0.00331	0.00431
SD of Outcome	0.711	0.714	0.711
Min of Outcome	-7.252	-7.252	-7.252
Max of Outcome	11.70	11.70	11.70
Program + Program × Aligned	-0.0644***		0.0233
	(0.0218)		(0.0540)
Program + Program × Low Baseline		−0.0292*	
		(0.0153)	
Program × Low Baseline + Program × Low Baseline × Aligned			−0.118**
			(0.0557)

Notes: This table shows the regression results of the main specification using program indicators of state capacity and overall public service delivery as outcomes. An observation represents a program indicator in a municipality in a year. The main independent variable, *Program*, is an indicator variable that equals one for each year after the municipality has entered the program. The specification includes state-year-indicator and municipality-indicator fixed effects. Column (1) interacts *Program* and the fixed effects with whether the municipality is governed by the same party as its state. Column (2) interacts them with whether the municipality received a low certification on the indicator in the first year of participating in the program instead. Column (3) considers the triple interaction instead. Standard errors, clustered at the municipality level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Column (2) in Table 3.5 reports the results for the interaction with a low initial certified status of a given indicator, which we use as a proxy for the municipal incumbent being corrupt, as opposed to honest. Consistent with Hypothesis 5, these results indicate that



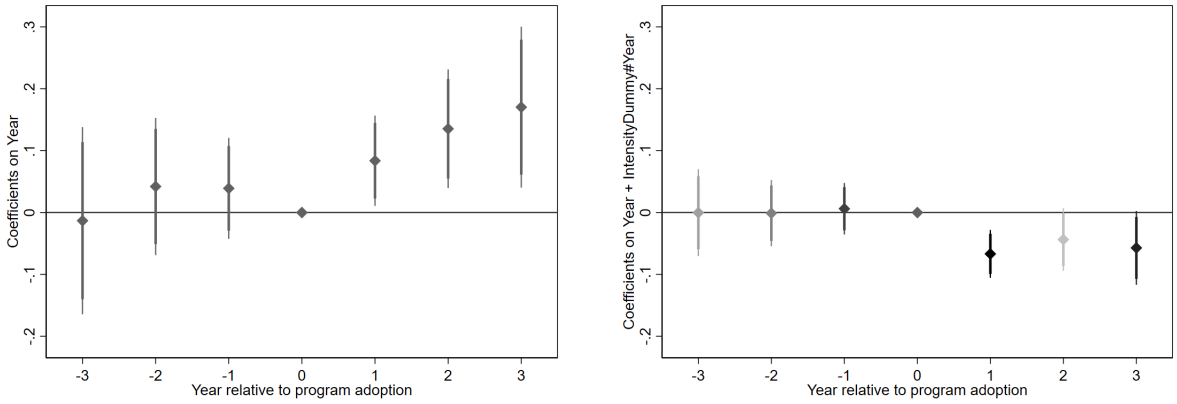
Panel A: Effect for Unaligned Municipalities

Panel B: Differential Effect for Aligned Municipalities

Figure 3.5: Average Effect on Service Delivery and Heterogeneous Effects by State Alignment

Notes: This figure shows the coefficients and confidence intervals of a regression of overall public service delivery on the year since a municipality entered the program interacted with state alignment. The sample includes each of the indexes for which we have measures constructed with data collected independently from the program. The specification includes state alignment-state-year-indicator and state alignment-municipality-indicator fixed effects. Panel (A) shows the coefficients on year since program start. Panel (B) shows the coefficients on year since program start *times* whether the municipality is governed by the same party as its state.

the effect of being certified by the program on overall public service delivery significantly decreased in municipalities with a low baseline status certified. This effect can also be seen graphically in Figure 3.6, which reports the effects of the program on overall public service delivery of certified municipalities by year since the year of program adoption. The plot on the left depicts the effect for municipalities with a high baseline status certified, while the plot on the right shows the differential effect for municipalities with a low baseline status certified. The coefficients on those plots also suggest that differential pre-trends in overall public service delivery of municipalities with a low baseline status certified cannot account for results in column (2) in Table 3.5.



Panel A: Effect for High Baseline

Panel B: Differential Effect for Low Baseline

Figure 3.6: Average Effect on Service Delivery and Heterogeneous Effects by Baseline Level of Certification

Notes: This figure shows the coefficients and confidence intervals of the year since a municipality entered the program interacted with an indicator of low baseline level of certification status on the indicator upon entry into the program. The sample includes each of the indexes for which we have measures constructed with data collected independently from the program. The specification includes state-year-indicator and municipality-indicator fixed effects. Panel (A) shows the coefficients on year since program start. Panel (B) shows the coefficients on year since program start *times* an indicator for low baseline level of certification status.

3.7 Robustness

We conduct several robustness exercises to ensure that our results are not driven by particular parameterizations of our regressors or and data quality issues. To begin with, we show in Table C.1 that the results in Table 3.5, and therefore the empirical support for Hypotheses 4 and 5, are robust to using different measures of baseline level of certification status, namely a non-parametric and linear ones.

We then conduct several robustness exercises to ensure that our results are not influenced by coding decisions. We show in Table C.2 that the result for columns (1) and (2) of Table 3.5, and therefore the empirical support for Hypotheses 3, 4 and 5, are robust to alternative coding of the program indicators reflecting state capacity investments and public service delivery. Namely, we use four alternative recoding strategies. In column (1) we replicate our baseline measure that uses an index of the corresponding certification status in each of the subindicators following the program specifications when possible. Column (2) uses an index of an indicator for whether at least the first cutoff (from red to yellow) was passed for each of the subindicators. Column (3) uses an index of an indicator for whether the second cutoff (from yellow to green) was passed for each of the subindicators. Columns (4) instead uses the raw data used to code up the certification status in each of the subindicators winsorized at the 99th percentile. Column (5) winsorizes at the 95th percentile instead. These results are highly robust both in terms of significance and magnitude.

3.8 Conclusion

Our findings suggest that the short-term unobservability of state capacity investments represent an important impediment to investments in state capacity and service delivery. They also indicate that, at least in theory, the certification of state capacity investments and service delivery could help to overcome such an impediment, but can also be undermined by existing institutional weaknesses. In particular, using a generalized difference-in-differences

design, we show that a certification program of state capacity and service delivery had no effect on average overall service delivery. We find evidence suggesting that these negligible effects are largely explained by the corruption of both the third parties certifying state-capacity investments and service delivery and the municipal incumbents.

Conclusion

This dissertation studies the characteristics and impacts of state building in fragile and weak states.

Chapter 1 argues that how the strength of the central state affects the power of traditional rulers is shaped by the existence or absence of institutional linkages between chiefs and the state. When the central state cooperates with the chiefs and integrates 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 central state does not institutionalize the chiefs, both act independently from each other, and chiefs act as substitutes. Studying the effects of state capacity is difficult due to the lack of fine-grained data, questions of how to measure state capacity, and endogeneity concerns. The chapter addresses these challenges via a spatial regression discontinuity design that uses distance of villages to their administrative headquarters as a measure of state capacity 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 support for the hypothesis 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 institutionally linked to the state), 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 in countries where traditional leaders are institutionally separated exhibit a smaller reduction in development outcomes when the local state is weak, indicating that traditional leaders are able to substitute for the state.

Chapter 2 examines the type of governance institutions created by armed groups since 1990 in a sample of 106 villages of Nord Kivu. We find that armed groups vary richly in the type of institutions they create, along multiple dimensions. We propose an approach to systematically operationalize the type of armed group's governance along an indirect rule vector, and a direct rule vector. We find that armed groups are more likely to choose indirect rule when they do not have ethnic ties with the village population, and when the traditional chief instead has ethnic ties with the population, and is hence, better able as an agent for the group. We further find that over time, armed groups consistently create institutions of direct rule, progressively penetrating all aspects of the political and economic life of the village as years under control increase. Using implicit association tests and survey data, we find no evidence to sustain that exposure to indirect rule undermines the support for the chief.

Chapter 3 suggests that the short-term unobservability of state capacity investments represents an important impediment to investments in state capacity and service delivery. The findings also indicate that, at least in theory, the certification of state capacity investments and service delivery could help to overcome such an impediment, but can also be undermined by existing institutional weaknesses. In particular, using a generalized difference-in-differences design, we show that a certification program of state capacity and service delivery had no effect on average overall service delivery. We find evidence suggesting that these negligible effects are largely explained by the corruption of both the third parties certifying state-capacity investments and service delivery and the municipal incumbents.

The dissertation's findings contribute to several literatures. First, the dissertation speaks to the vast literature discussing the role of institutions on economic development and public good provision. Chapter 1 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). Chapter 2 has implications for research and policy on institutional choice. It offers new evidence on the discussion of indirect rule by studying its causes and consequences (Mamdani 1996; Acemoglu et al. 2014). Chapter 3 is closely linked to the literature debating the association between political competition—often measured by the strength of democratic institutions—and public good provision, and more generally for economic development. While earlier work points at a positive association (Acemoglu et al. 2019; Besley, Persson, and Sturm 2010; Besley and Kudamatsu 2006; Diaz-Cayeros, Estevez, and Magaloni 2016; Galasso and Nannicini 2011; Hatfield and Kosec 2013; Naidu 2012; Nath 2015; Solé-Ollé and Viladecans-Marsal 2012), recent work highlights that the association may instead be negative in the context of clientelistic, younger democracies (Gottlieb and Kosec 2018; Fergusson, Larreguy, and Riaño 2018).[16] Our findings add credence to both perspectives, showing that interventions from higher levels of government can both increase performance and create political incentives for manipulation.

Second, the findings extend the recently emerging literature on traditional chiefs (Logan 2009, 2013; Koter 2013; Baldwin 2013, 2014, 2016; de Kadt and Larreguy 2018). Chapter 1 adds an important determinant of chief power, local state capacity, to explain local variation. 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

[16]Suryanarayan (2017) also suggests that electoral incentives may lead powerful elites to weaken the state. However, rather than curtailing the bureaucratic capacity to deliver public goods and services, she focuses on elites' efforts to weaken the tax infrastructure so that potential new actors with political power have limited influence their wealth.

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). Chapter 1 reconciles these competing predictions by establishing the institutionalization of traditional leaders as the key moderating factor. Chapter 2 then investigates what determines this institutional choice (Boone 2003).

Third, the dissertation contributes to the literature on state capacity (Herbst 2000; Fukuyama 2013; Acemoglu, Camilo, and Robinson 2015; Dell, Lane, and Querubin 2018). Chapter 1 presents evidence of its local effects on traditional chiefs and offers a new data set that allows better measurement and identification of variation in state capacity (Hendrix 2010; Soifer 2012; Lee and Zhang 2017; Fergusson, Larreguy, and Riaño 2018). Chapter 2 examines the trade-off rulers face when deciding whether to build new state capacity or use existing structures (Bates 1983; Besley, Persson, and Sturm 2010; Greif 2008; Padró I Miquel and Yared 2012). Chapter 3 advances the literature on the determinants of state capacity by considering the effectiveness of programs designed to encourage long-dwindling investments in state capacity. In contrast with extant studies seeking to explain the impetus for investments in capacity, we study the role that certifying programs aimed at strengthening local bureaucratic capacity to improve service delivery can play in creating political incentives for investments in state capacity (see also Soifer 2015; Fergusson, Larreguy, and Riaño 2018). Like Banerjee, Duflo, and Glennerster (2008) and Raffler (2018), we also highlight the difficulty of designing incentive structures to prevent manipulation—in our case, of a political form.

State building remains a crucial challenge in developing countries across the world. My dissertation shows the crucial role local institutions and incentives play in determining how state building shapes political and economic development.

A | Appendix to Chapter 1

A.1 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*

Table A.1: 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 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*

- **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)*

A.2 Photos

Panel A: Meeting Room

Panel B: Bridge

Panel C: Water Tap

Panel D: Water Source

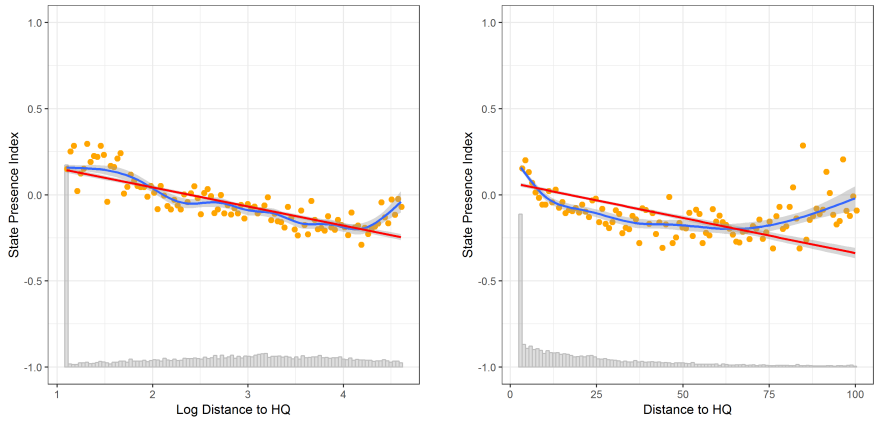
Panel E: Bricks

Panel F: Road Clearing

Figure A.1: Public Goods Provided by Traditional Leaders in DRC

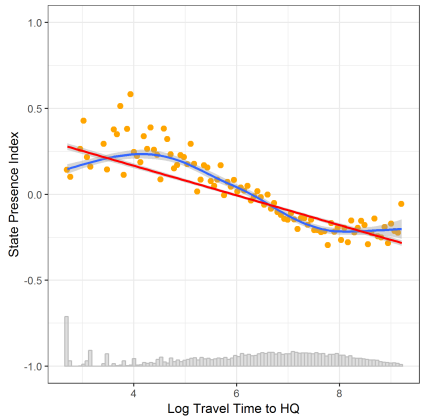
Notes: These pictures show public goods provided by chiefs in villages in the Democratic Republic of the Congo. The pictures were taken during the collection of qualitative interviews with village chiefs in more than 20 villages in the North and South Kivu provinces of the DRC.

A.3 Additional Figures

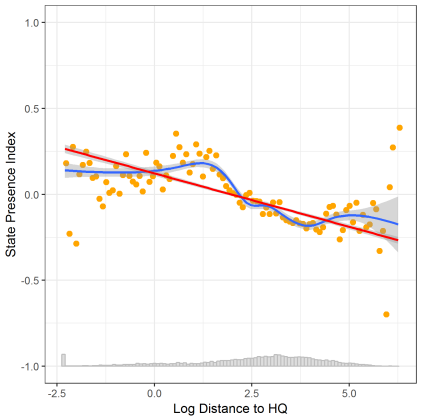


Panel A: Log Distance

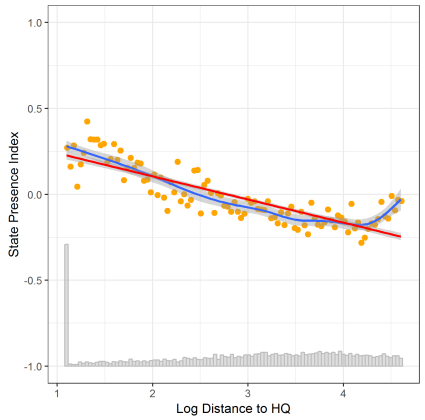
Panel B: Distance



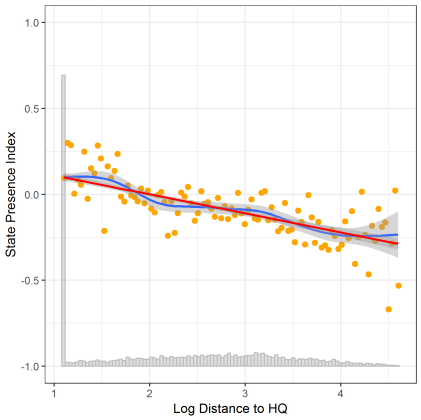
Panel C: Log Travel Time



Panel D: Raw Log Distance



Panel E: Admin 1



Panel F: Admin 2

Figure A.2: 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.

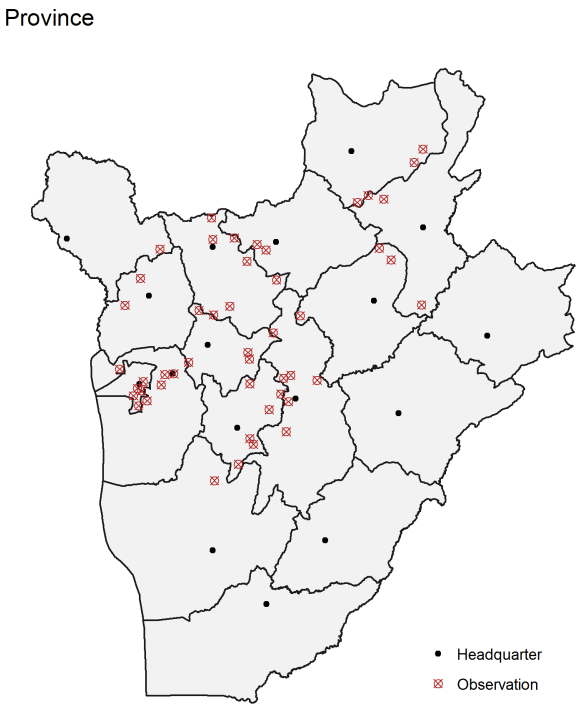


Figure A.3: Borders, Headquarters, and Observations: Admin Level 1 Burundi

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). It uses the second administrative division, communes.

A.4 Additional Tables

Summary Statistics

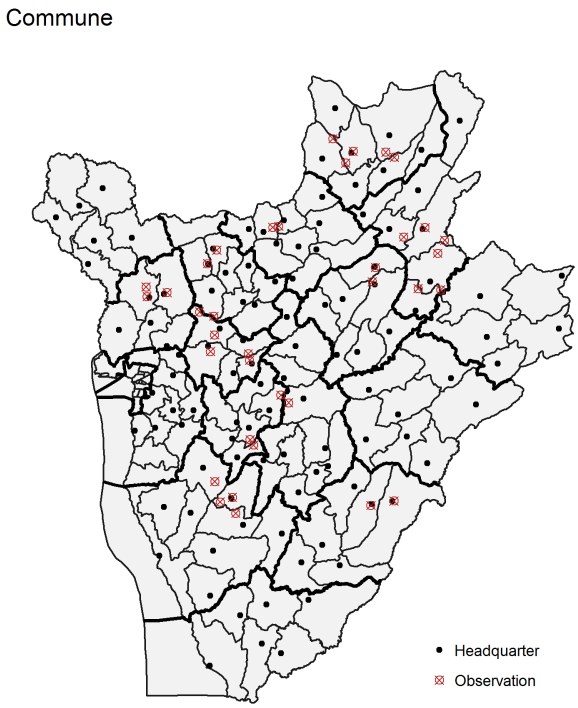


Figure A.4: Borders, Headquarters, and Observations: Admin Level 2 Burundi

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). It uses the first administrative division, provinces.

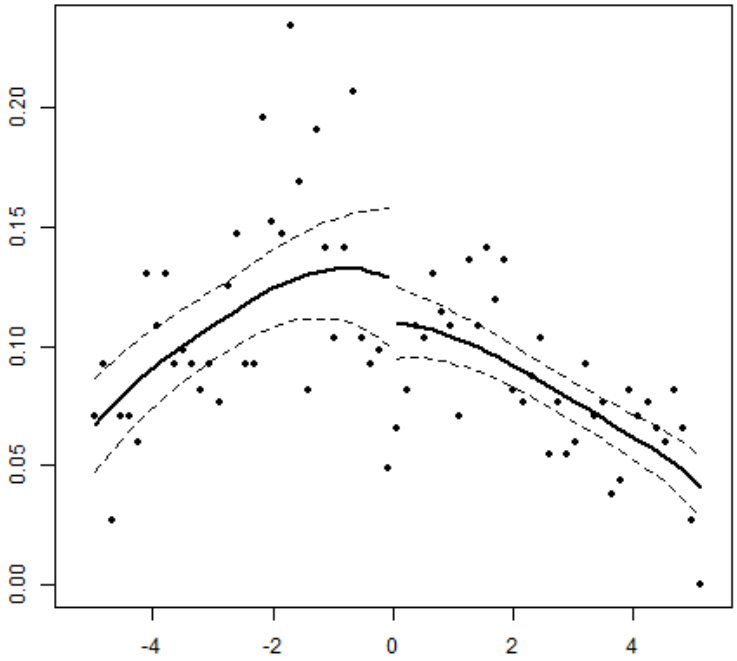


Figure A.5: Results of McCrary Test

Notes: This figure shows the histogram and density estimations for the McCrary sorting test using a 5km bandwidth.

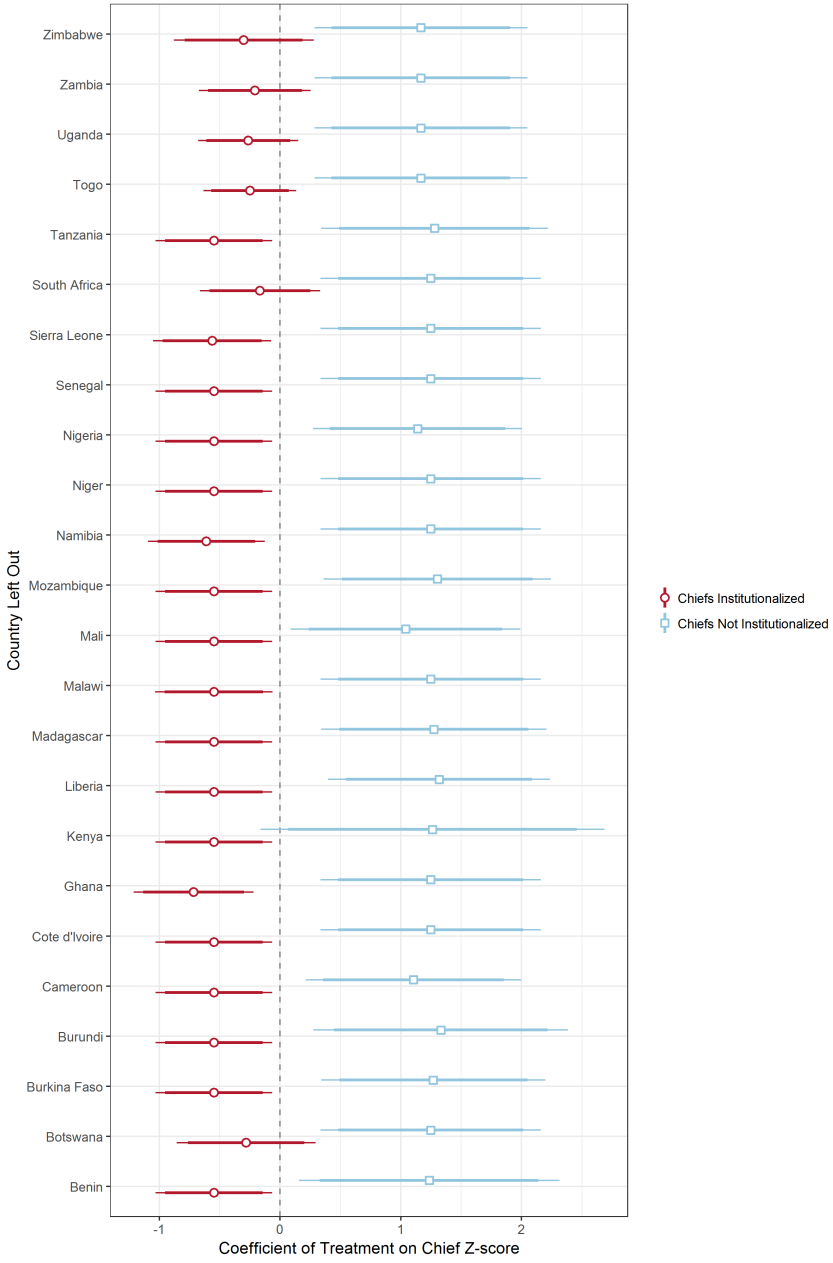


Figure A.6: Results when leaving out individual countries

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 1.3.

Table A.2: 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.

Migration

Table A.3: Effect of Treatment on Migration

	Dependent variable:			
	Migration			
	Children	Men	Women	Z-score
	(1)	(2)	(3)	(4)
Low State Presence Treatment	0.017	−0.049	−0.016	−0.035
	(0.025)	(0.053)	(0.040)	(0.023)
Treatment X Institutionalized	0.011	0.054	−0.022	0.030
	(0.056)	(0.066)	(0.069)	(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^2	0.316	0.130	0.204	0.571
Clustered standard errors in parentheses				*p<0.1; **p<0.05; ***p<0.01

Geographic Outcomes

Table A.4: Effect of Treatment on Historical and Geographical Controls using Afrobarometer and DHS Data

	Dependent variable:									
	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	0.027**	0.001	0.003	0.136	0.042	0.004	0.091	0.004	0.018***
	(0.003)	(0.012)	(0.003)	(0.025)	(0.145)	(0.041)	(0.003)	(0.073)	(0.006)	(0.007)
Treatment X Institutionalized	0.010	−0.016	0.005	−0.015	−0.091	−0.037	0.005	−0.050	−0.014	0.008
	(0.006)	(0.031)	(0.006)	(0.042)	(0.230)	(0.075)	(0.006)	(0.079)	(0.014)	(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^2	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

Robustness Checks

Table A.5: Robustness: Different Measures of Institutional Context

	Dependent variable:		
	Chief Z-Score		
	(1)	(2)	(3)
Low State Presence Treatment	0.194***	0.189***	0.190***
	(0.066)	(0.066)	(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^2	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 1.3 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 A.6: Covariate Balance — Country-Level Variables

	Not Institutionalized		Institutionalized		
Covariates (country level)	**N**	**Mean**	**N**	**Mean**	**p-value**
Historical Centralization	14	0.77	9	0.81	0.62
Year of Indpendence	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 A.7: Robustness: Interaction with Country Variables

	Dependent variable:							
	Chief Z-Score							
	Pop. 1400	Brit. Colony	Brit. Legal	Settler Colony	Gemstones	Ruggedness	Malaria Suit.	Dem. Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Low Local State Presence	0.141***	0.127***	0.120***	0.151***	0.127**	0.104**	0.109*	0.143***
	(0.051)	(0.040)	(0.039)	(0.048)	(0.057)	(0.051)	(0.062)	(0.051)
Treatment X Institutionalized	−0.202***	−0.177***	−0.164***	−0.183***	−0.159***	−0.145**	−0.133	−0.202***
	(0.065)	(0.058)	(0.056)	(0.063)	(0.059)	(0.061)	(0.086)	(0.060)
Treatment X CountryVariable	0.024	−0.022	−0.033	−0.049*	−0.029	−0.081**	0.071	−0.009
	(0.043)	(0.042)	(0.040)	(0.029)	(0.044)	(0.040)	(0.055)	(0.022)
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	635	635	635	635	635	635	635
Adjusted R^2	0.596	0.596	0.596	0.598	0.603	0.602	0.600	0.596
Clustered s.e. in parentheses								*p<0.1; **p<0.05; ***p<0.01

Table A.8: Robustness: Different Specifications

	Dependent variable:					
	Chief Z-Score					
	Main	No Controls	Binary Treatment	No Scaling	Long/Lat	Cluster
	(1)	(2)	(3)	(4)	(5)	(6)
Low State Presence Treatment	0.194^{***}	0.109^{**}	0.311	0.184^{***}	0.112^{*}	0.194^{**}
	(0.066)	(0.052)	(0.225)	(0.064)	(0.058)	(0.081)
Treatment X Institutionalized	-0.279^{***}	-0.149^{**}	-0.534^{*}	-0.244^{***}	-0.132^{**}	-0.279^{***}
	(0.077)	(0.063)	(0.284)	(0.083)	(0.066)	(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^2	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

Table A.9: Robustness: Different Measurement

	Dependent variable:					
	Chief Z-Score					
	Main	Drop 100km	Drop 50km	No Restriction	Non-Logged	Traveltime
	(1)	(2)	(3)	(4)	(5)	(6)
Low State Presence Treatment	0.194^{***}	0.239^{**}	0.262^{***}	0.174^{***}	0.144^{**}	0.116
	(0.066)	(0.097)	(0.100)	(0.049)	(0.061)	(0.083)
Treatment X Institutionalized	-0.279^{***}	-0.307^{***}	-0.350^{***}	-0.250^{***}	-0.243^{***}	-0.206^{**}
	(0.077)	(0.107)	(0.126)	(0.061)	(0.069)	(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^2	0.598	0.604	0.602	0.599	0.598	0.598
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 1.3 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 A.10: Robustness: Headquarters and Boundaries

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

Clustered standard errors in parentheses *p<0.1; **p<0.05; ***p<0.01

B | Appendix to Chapter 2

B.1 Figures

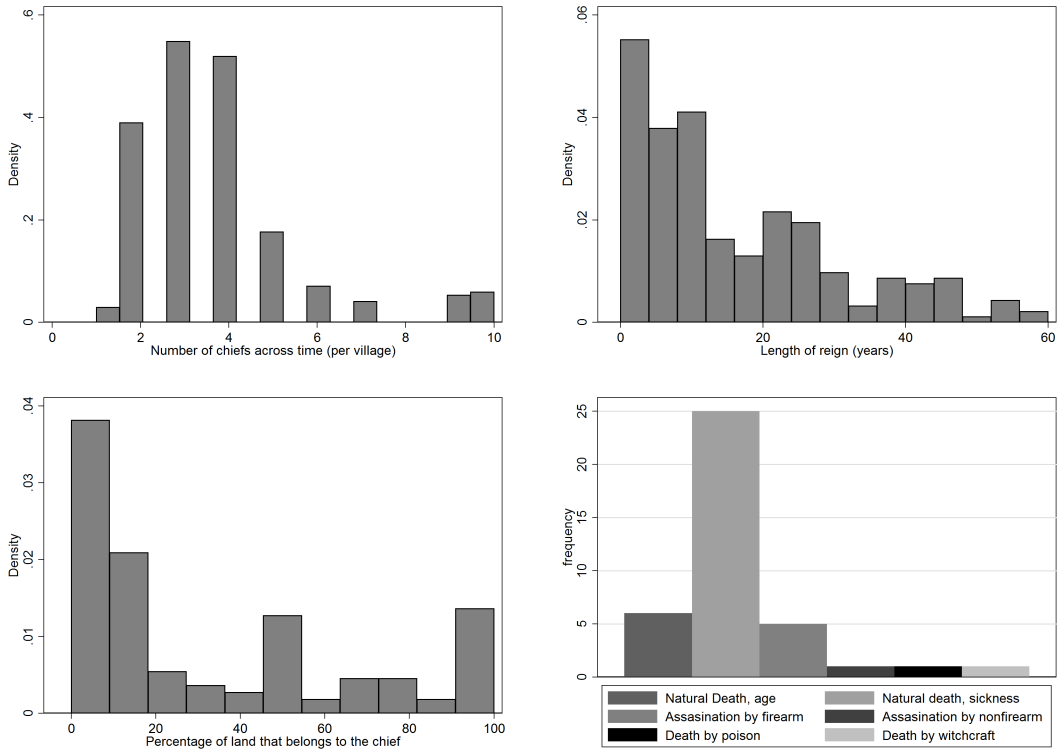


Figure B.1: Descriptive statistics of traditional chiefs

Notes: The upper left panel presents the distribution of the number of chiefs across time,for each village, recorded in the survey, since 1990. The upper right panel presents the distribution of the typical reign length for a chief in the sample in years. The lower left panel presents the proportion of land owned by the chief today. The lower right panel presents the distribution of the causes of chiefs' death.

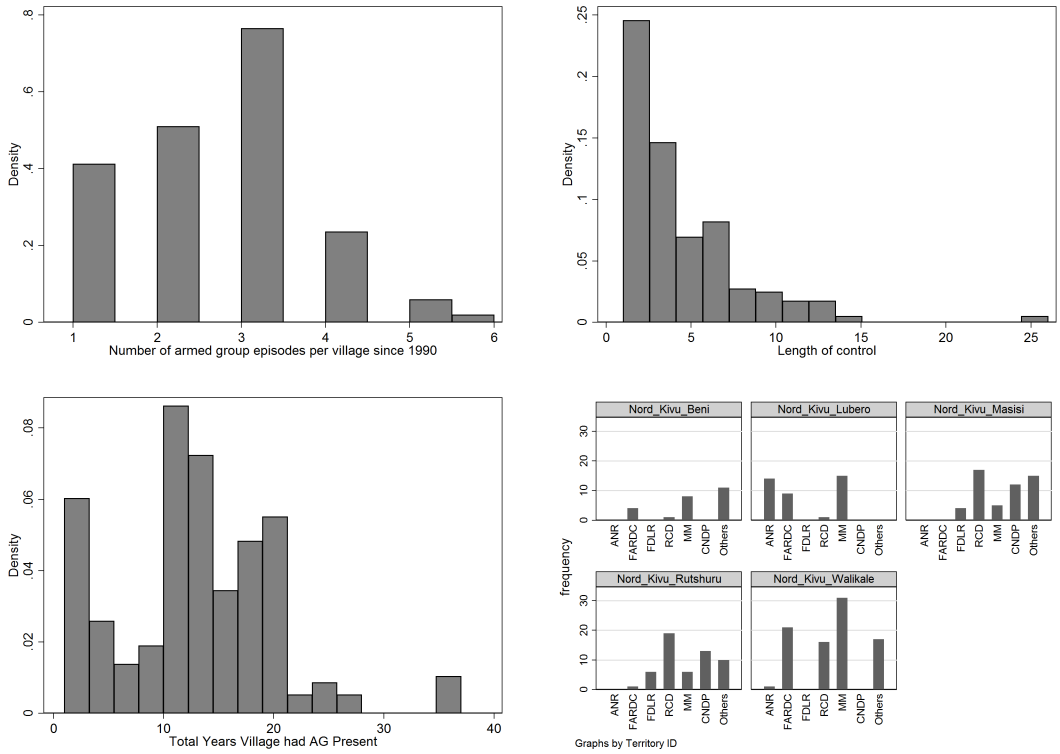


Figure B.2: Descriptive statistics of episodes of armed groups

Notes: The upper left panel shows the number of armed group episodes per village since 1990 in each village. The upper right panel shows the distribution of the duration of control for each armed group's episode. The lower left panel presents the distribution of the years under armed group control per village. The lower right panel shows the occurrence of different armed groups by territory.

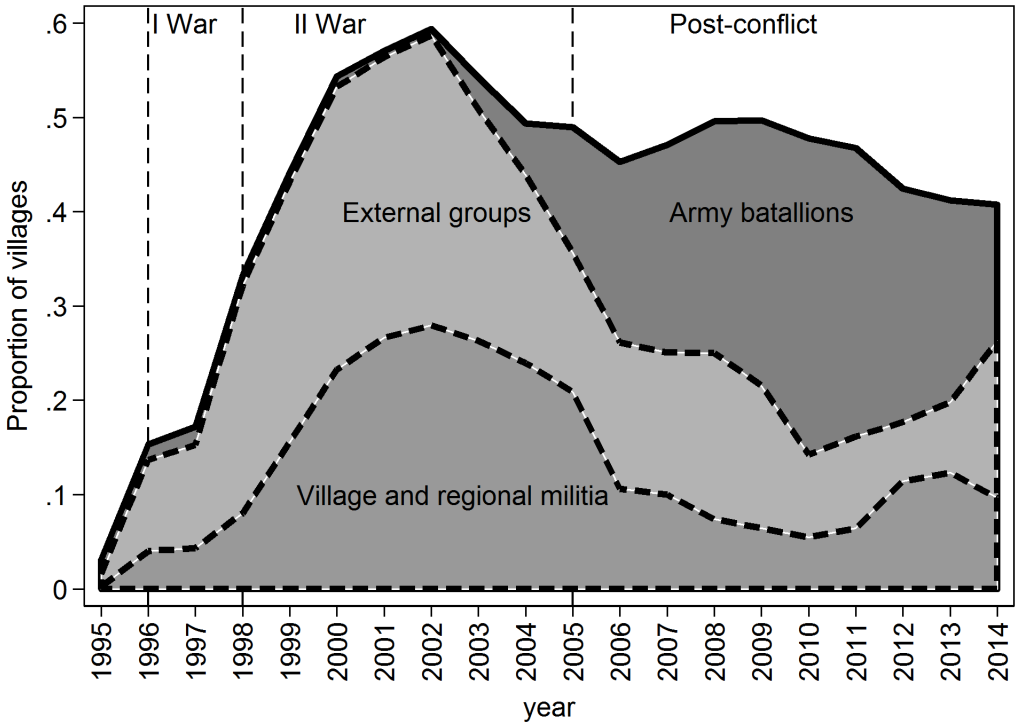
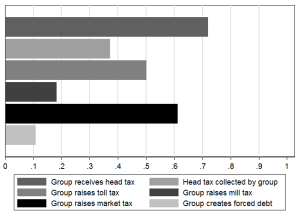
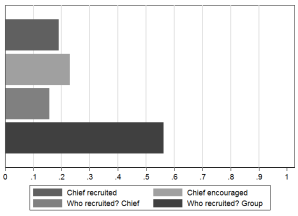


Figure B.3: Composition of armed actors across the period

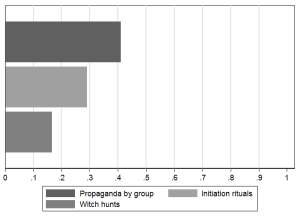
Notes: This figure graphs the proportion of sites in the sample under the control of armed actors on year using the data from this study in Nord Kivu, pooled with the data from Sud Kivu. The dashed vertical lines indicate the start and end of the Second Congo War. The state integrated local armed groups into the national army after 2003, only partially changing their structures of command or autonomy. The distinction between the Congolese Army and irregular armed groups is thus often blurred. Source: Sanchez de la Sierra (2019).



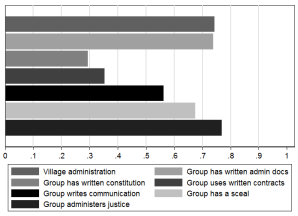
Panel A: Taxation and tribute



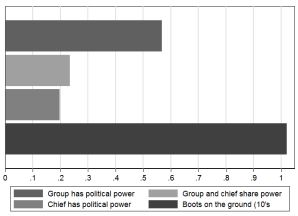
Panel B: Recruitment campaigns



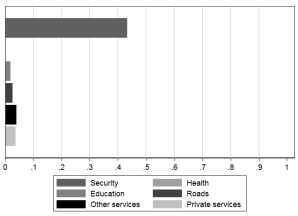
Panel C: Legitimation



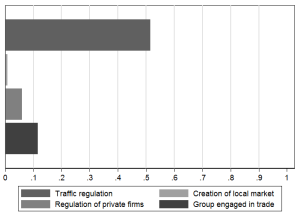
Panel D: Administration



Panel E: Political power



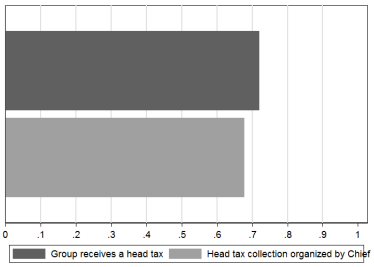
Panel F: Public service



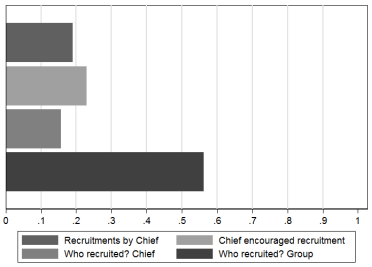
Panel G: Economic regulation

Figure B.4: Dimensions of direct rule

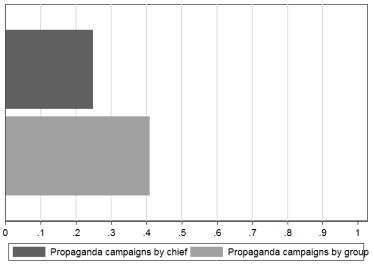
Notes: This figure shows the mean of the various dimensions of the direct rule vector. The panels restrict the data to the years in which an armed group is ruling in the village. Panel A shows the proportion of years under an armed group's episode in which a head tax is collected for the group, and where the armed group is charged to collect the head tax. Panel B shows the proportion of recruitments for the group organized by the group. Panel C shows the legitimation efforts for the group tasked to the group. Panel D shows the proportion of years in which the village administration was managed directly by the group. Panel E shows the distribution of political power when armed groups control a village. Panel F shows the proportion of years in which armed groups deliver public services. Panel G shows the proportion of years in which armed groups regulated the local economy.



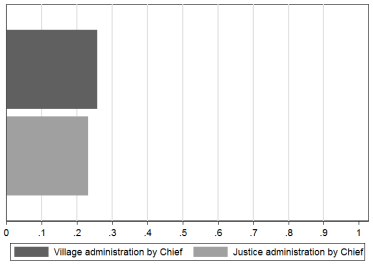
Panel A: Taxation and tribute



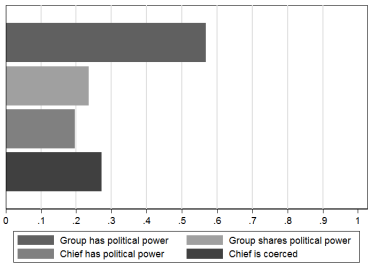
Panel B: Recruitment campaigns



Panel C: Legitimation



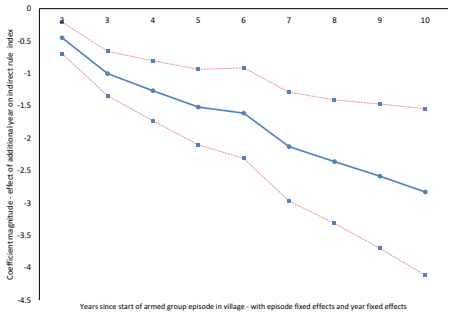
Panel D: Administration



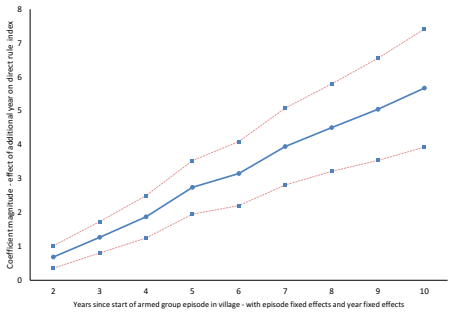
Panel E: Political power

Figure B.5: Dimensions of indirect rule

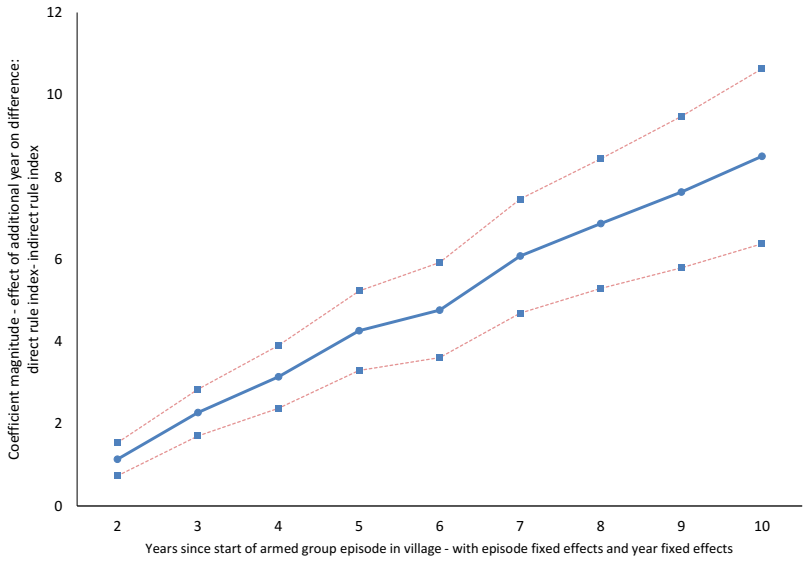
Notes: This figure shows the mean of the various dimensions of the indirect rule vector. The panels restrict the data to the years in which an armed group is ruling in the village. Panel A shows the proportion of years under an armed group's episode in which a head tax is collected for the group, and where the chief is charged to collect the head tax. Panel B shows the proportion of recruitments for the group organized by the chief. Panel C shows the legitimation efforts for the group tasked to the chief. Panel D shows the proportion of years in which the village administration is left in the chief's hands. Panel E shows the distribution of political power when armed groups control a village.



Panel A: Indirect rule index



Panel B: Direct rule index



Panel C: Direct rule index - Indirect rule index

Figure B.7: Effects of armed group's tenure on type of rule

Notes: This figure shows the effect of additional years of armed groups' tenure on the type of institution created. In all figures, we regress the governance indices on armed group episode fixed effects, on year fixed effects, and on group tenure fixed effects. The group tenure variable indicates how many years, after the start, have elapsed since the group controls the village, for each specific armed group episode. The figures present the coefficient on each group tenure year dummy. Thus, the value on the vertical axis indicates the magnitude of the effect of an additional year of tenure in the village on the governance indices.

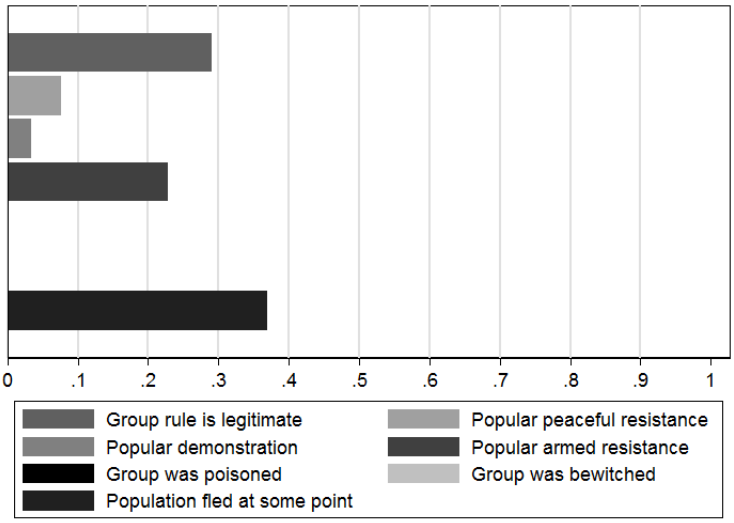


Figure B.6: Outcomes: legitimacy of armed group ruling and oppositions

Notes: This figure presents the outcomes of armed group's legitimacy based on survey data These are endogenous to the group's original legitimacy, and the efforts made by the group at legitimation.

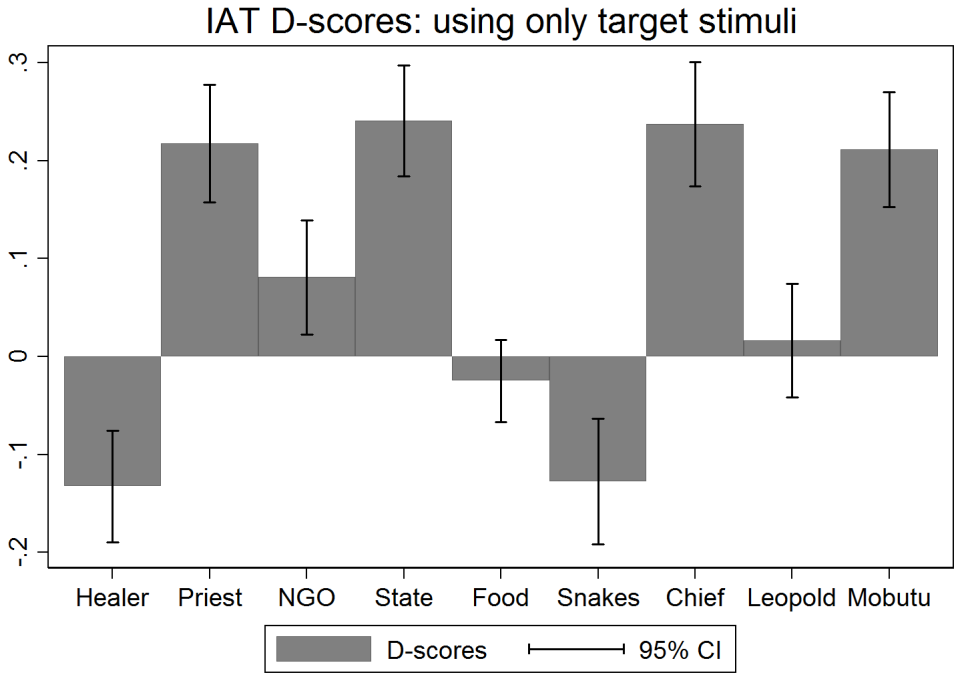


Figure B.8: Implicit association tests: benchmark results

Notes: This figure presents the baseline implicit association tests on a variety of dimensions. The dimensions of healer and snakes are introduced for validation of the measure, since they both unambiguously invoke negative emotions.

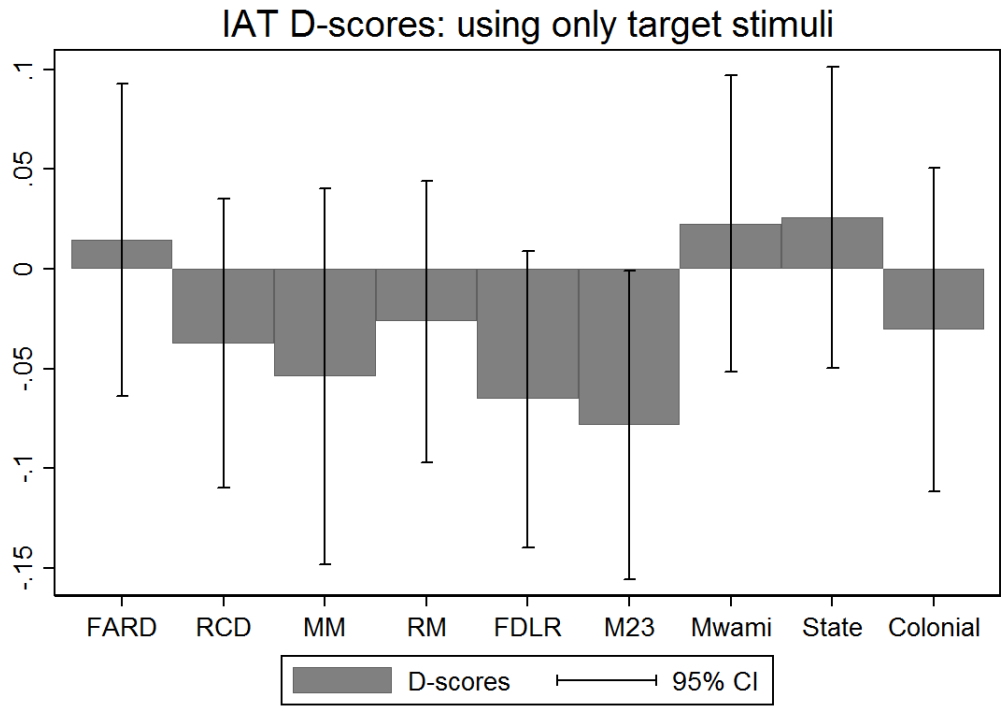


Figure B.9: Implicit association tests: armed groups' results

Notes: This figure presents the implicit association tests for authorities Overall, associations are slightly more positive for the Congolese army, the traditional chiefs, and the Congolese state than for any armed group or the colonial state, but the differences are not significant. The least negatives armed groups are the Raia Mutombokis and the RCD, while those generating the most negative associations are the M23, the FDLR and the Mayi Mayis.

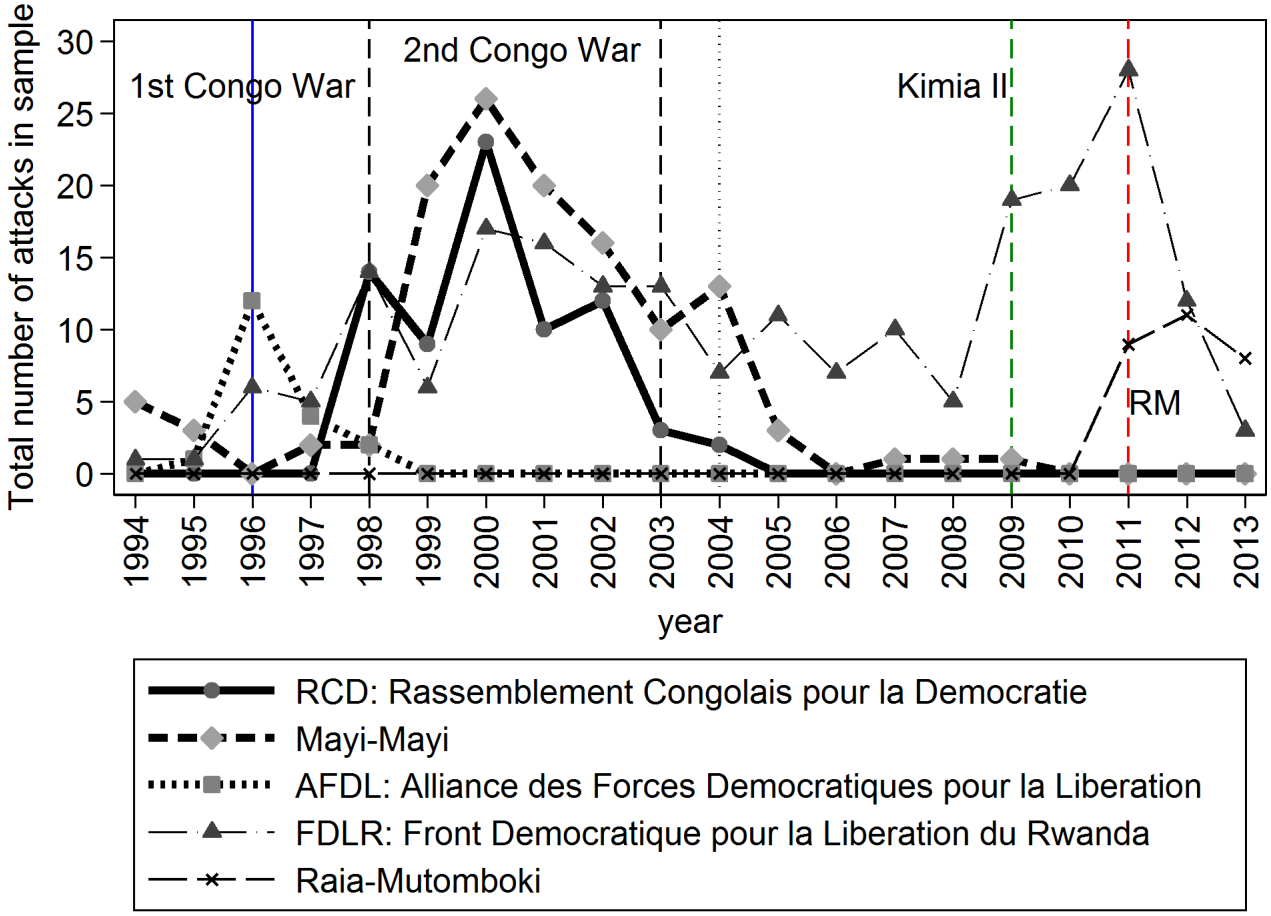


Figure B.10: Recorded violent Events and known historical rebellions (Sanchez de la Sierra 2019)

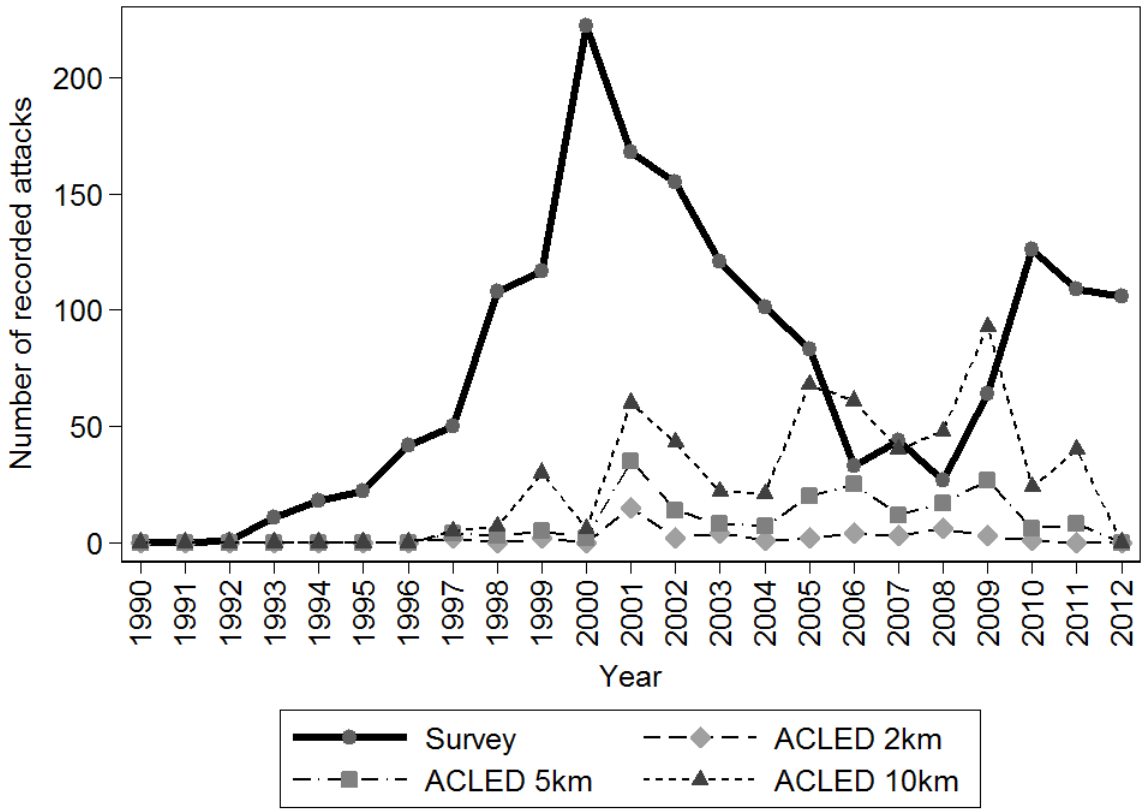


Figure B.11: Classical measurement error due to recall? Survey and ACLED violent events (Sanchez de la Sierra 2019)

B.2 Tables

Table B.1: Modes of armed groups' governance (Sud Kivu and North Kivu, pooled)

			Distribution of governance episode by major group					
Type of rule	frequency	percentage	Mayi-Mayis	RCD	Raia M.	Army	FDLR	other
Any rule	508	100%	126	106	38	130	43	65
Indirect rule	164	32%	40	30	11	70	4	9
Shared rule	100	20%	23	24	17	22	5	9
Direct rule	192	38%	53	46	9	15	22	47
Unknown	52	10%	10	6	1	23	12	0
Total villages	239							

Notes: This table presents the distribution of political power across armed groups episodes of governance in North Kivu and Sud Kivu. While there is significant variation in the type of rule along this dimension, there is also large variation within armed groups and across villages and periods. The dimension of political power is the only one that is also found in the Sud Kivu pilot sample.

Table B.2: Impact of ethnicity - direct rule

VARIABLES	(1) DIRECT taxation	(2) DIRECT recruitment	(3) DIRECT legitimation	(4) DIRECT service	(5) DIRECT regulation	(6) DIRECT admin	(7) DIRECT justice	(8) DIRECT political	(9) DIRECT size	(10) DIRECT INDEX
Coethnic Group-Villagers	-0.03	0.08	0.16	0.37**	-0.22	-0.02	0.23	0.18	-0.15	0.15
	(0.14)	(0.10)	(0.18)	(0.16)	(0.16)	(0.18)	(0.17)	(0.18)	(0.20)	(0.61)
Coethnic Village-Chief	-0.29**	-0.02	-0.16	-0.36**	-0.44***	-0.30*	-0.44***	-0.44**	0.03	-1.98***
	(0.14)	(0.10)	(0.17)	(0.15)	(0.16)	(0.17)	(0.16)	(0.17)	(0.19)	(0.58)
Constant	0.46***	0.53***	0.46***	0.12	0.43***	0.10	0.31**	0.54***	0.05	2.97***
	(0.13)	(0.09)	(0.16)	(0.15)	(0.15)	(0.16)	(0.15)	(0.16)	(0.18)	(0.54)
Observations	198	198	198	198	198	198	198	189	198	189
R-squared	0.61	0.26	0.63	0.28	0.47	0.49	0.44	0.41	0.39	0.52
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
A. G. FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table B.3: Impact of ethnicity - indirect rule

VARIABLES	(1) Indirect taxation	(2) Indirect recruitment	(3) Indirect legitimation	(4) Indirect admin	(5) Indirect justice	(6) Indirect political	(7) Indirect INDEX
Coethnic Group-Villagers	0.16	-0.01	0.31	-0.16	-0.23	-0.11	0.05
	(0.15)	(0.18)	(0.22)	(0.15)	(0.17)	(0.15)	(0.49)
Coethnic Village-Chief	0.05	0.13	-0.06	0.35**	0.44***	0.25*	1.07**
	(0.15)	(0.17)	(0.21)	(0.14)	(0.16)	(0.14)	(0.47)
Constant	0.18	-0.13	0.10	-0.42***	-0.31**	-0.35**	-0.89**
	(0.14)	(0.16)	(0.20)	(0.14)	(0.15)	(0.14)	(0.44)
Observations	198	198	198	198	198	189	189
R-squared	0.47	0.37	0.25	0.50	0.44	0.44	0.30
Year FE	YES	YES	YES	YES	YES	YES	YES
A. G. FE	YES	YES	YES	YES	YES	YES	YES

Table B.4: Impact of chief's kinship with villagers on governance mode during armed group's episode: direct rule

VARIABLES	(1) DIRECT taxation	(2) DIRECT recruitment	(3) DIRECT legitimation	(4) DIRECT service	(5) DIRECT regulation	(6) DIRECT admin	(7) DIRECT justice	(8) DIRECT political	(9) DIRECT force	(10) DIRECT INDEX
Kinship village-chief (# families)	-0.09*	0.05	0.06	0.01	-0.09	0.23***	-0.09	-0.15**	0.13*	0.10
	(0.05)	(0.03)	(0.06)	(0.03)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)	(0.21)
Constant	0.50***	0.36***	0.15	-0.17**	0.32*	-0.84***	0.23	0.65***	-0.33	1.12*
	(0.15)	(0.10)	(0.19)	(0.08)	(0.17)	(0.18)	(0.18)	(0.18)	(0.21)	(0.64)
Observations	176	176	176	176	176	176	176	169	176	169
R-squared	0.61	0.28	0.59	0.22	0.44	0.54	0.46	0.40	0.37	0.48
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
A. G. FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table B.5: Impact of chief's kinship with villagers on governance mode during armed group's episode: indirect rule

VARIABLES	(1) Indirect taxation	(2) Indirect recruitment	(3) Indirect legitimation	(4) Indirect admin	(5) Indirect justice	(6) Indirect political	(7) Indirect INDEX
Kinship village-chief (# families)	-0.10*	-0.01	0.15**	-0.05	0.09	0.02	0.12
	(0.05)	(0.06)	(0.07)	(0.05)	(0.06)	(0.05)	(0.17)
Constant	0.55***	0.03	-0.33	-0.04	-0.23	-0.22	-0.29
	(0.16)	(0.19)	(0.22)	(0.17)	(0.18)	(0.16)	(0.51)
Observations	176	176	176	176	176	169	169
R-squared	0.42	0.38	0.28	0.44	0.46	0.41	0.30
Year FE	YES	YES	YES	YES	YES	YES	YES
A. G. FE	YES	YES	YES	YES	YES	YES	YES

Table B.6: Impact of chief's land ownership on governance mode: direct rule

VARIABLES	(1) DIRECT taxation	(2) DIRECT recruitment	(3) DIRECT legitimation	(4) DIRECT service	(5) DIRECT regulation	(6) DIRECT admin	(7) DIRECT justice	(8) DIRECT size	(9) DIRECT political	(10) DIRECT INDEX
Chief-owned land (prop), 1998	0.01	0.03	-0.05	0.26*	0.13	-0.43***	0.56***	-0.12	0.51***	0.41
	(0.13)	(0.09)	(0.15)	(0.14)	(0.14)	(0.16)	(0.15)	(0.19)	(0.16)	(0.59)
Constant	0.20**	0.54***	0.36***	-0.20**	-0.05	0.08	-0.40***	0.15	-0.05	1.14***
	(0.09)	(0.06)	(0.10)	(0.10)	(0.10)	(0.11)	(0.11)	(0.13)	(0.11)	(0.42)
Observations	202	202	202	202	202	202	202	202	190	190
R-squared	0.57	0.26	0.63	0.32	0.43	0.49	0.47	0.32	0.42	0.44
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
A. G. FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table B.7: Impact of chief's land ownership on governance mode: indirect rule

VARIABLES	(1) Indirect taxation	(2) Indirect recruitment	(3) Indirect legitimation	(4) Indirect admin	(5) Indirect justice	(6) Indirect political	(7) Indirect INDEX
Chief-owned land (prop), 1998	0.15	-0.40**	0.04	-0.30**	-0.56***	-0.40***	-1.61***
	(0.13)	(0.16)	(0.19)	(0.14)	(0.15)	(0.14)	(0.46)
Constant	0.17*	0.21*	0.04	0.00	0.40***	0.09	1.02***
	(0.09)	(0.11)	(0.13)	(0.10)	(0.11)	(0.10)	(0.33)
Observations	202	202	202	202	202	190	190
R-squared	0.48	0.35	0.20	0.43	0.47	0.43	0.32
Year FE	YES	YES	YES	YES	YES	YES	YES
A. G. FE	YES	YES	YES	YES	YES	YES	YES

Table B.8: Impact of armed group's tenure on governance mode: direct rule

VARIABLES	(1) DIRECT taxation	(2) DIRECT recruitment	(3) DIRECT legitimation	(4) DIRECT service	(5) DIRECT regulation	(6) DIRECT admin	(7) DIRECT justice	(8) DIRECT political	(9) DIRECT force	(10) DIRECT INDEX
Group's tenure (# years)	0.17***	0.00	-0.03	0.01	0.02	0.01**	0.19***	0.00	0.16***	0.49***
	(0.02)	(0.00)	(0.03)	(0.02)	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)	(0.07)
Constant	1.65***	0.51	-0.01	-0.22	0.15	0.03	1.83***	0.04	1.56***	5.76***
	(0.28)	(0.00)	(0.42)	(0.29)	(0.27)	(0.04)	(0.33)	(0.00)	(0.34)	(1.00)
Observations	1,002	1,002	1,002	1,002	1,002	1,002	1,002	931	1,002	931
R-squared	0.94	1.00	0.86	0.93	0.94	1.00	0.91	1.00	0.90	0.95
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
A.G. Episode FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table B.9: Impact of armed group's tenure on governance mode: indirect rule

VARIABLES	(1) Indirect taxation	(2) Indirect recruitment	(3) Indirect legitimation	(4) Indirect admin	(5) Indirect justice	(6) Indirect political	(7) Indirect INDEX
Group's tenure (# years)	0.08***	0.00	-0.22***	-0.05**	-0.19***	-0.00	-0.39***
	(0.02)	(0.01)	(0.04)	(0.02)	(0.02)	(0.00)	(0.05)
Constant	0.75**	0.11	-2.38***	-0.36	-1.83***	0.00	-3.71***
	(0.30)	(0.17)	(0.53)	(0.30)	(0.33)	(0.00)	(0.78)
Observations	1,002	1,002	1,002	1,002	1,002	931	931
R-squared	0.93	0.98	0.78	0.93	0.91	1.00	0.91
Year FE	YES	YES	YES	YES	YES	YES	YES
A.G. Episode FE	YES	YES	YES	YES	YES	YES	YES

Table B.10: Impact of chief's tenure on governance mode: direct rule

VARIABLES	(1) DIRECT taxation	(2) DIRECT recruitment	(3) DIRECT legitimation	(4) DIRECT service	(5) DIRECT regulation	(6) DIRECT admin	(7) DIRECT justice	(8) DIRECT political	(9) DIRECT force	(10) DIRECT INDEX
Chief years in power	-0.02**	0.01	-0.01	0.01	0.01	0.01	-0.02**	-0.01	-0.01	-0.03
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
Constant	0.04	0.59	0.70	-0.32	0.01	0.05	0.47	-0.07	0.33	2.37
	(0.67)	(0.52)	(0.83)	(0.92)	(0.91)	(0.99)	(0.85)	(0.97)	(1.11)	(3.24)
Observations	164	164	164	164	164	164	164	156	164	156
R-squared	0.79	0.54	0.80	0.50	0.60	0.66	0.65	0.58	0.52	0.66
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
A. G. FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table B.11: Impact of chief's tenure on governance mode: indirect rule

VARIABLES	(1) Indirect taxation	(2) Indirect recruitment	(3) Indirect legitimation	(4) Indirect admin	(5) Indirect justice	(6) Indirect political	(7) Indirect INDEX
Chief years in power	-0.01	-0.01	-0.01	0.01*	0.02**	0.01	0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
Constant	0.26	0.47	0.92	-0.22	-0.47	0.49	1.45
	(0.77)	(0.98)	(1.15)	(0.78)	(0.85)	(0.74)	(2.60)
Observations	164	164	164	164	164	156	156
R-squared	0.67	0.59	0.50	0.65	0.65	0.63	0.54
Year FE	YES	YES	YES	YES	YES	YES	YES
A. G. FE	YES	YES	YES	YES	YES	YES	YES

B.3 Discussion: measurement error due to recall

Recall data can contain mistakes and respondents may resort to inference to reconstruct memory. This can lead to measurement error.[1]

B.3.1 Track record of recall data collection and lessons

While many municipalities lack written records of administrative data, due to the weakness of the central bureaucracy, historical events are meticulously kept and transmitted orally across generations in Eastern Congo. The strategy proposed in this paper is, in fact, not new, and responds to the cultural context of Eastern Congo. Historians, anthropologists, and economists have a long track record of working with this cultural feature, called oral history, to learn about the past of these societies, and discussing the biases that may arise (Newbury 1992; Vansina 1978, 2005; Acemoglu, Reed, and Robinson 2014; Sanchez de la Sierra 2019).[2]

Villages in Eastern Congo have a group of "Elders" responsible for narrating the history of their community. Elders usually transmit the historical information of their village and tribe in weekly community meetings where the entire village has to attend, the "Barza". Furthermore, every evening, the "chief" of the household narrates the history of the family to his descendants around the fire. There is a very strong norm of transmission, precisely because these communities usually lack written records. The safeguards that we describe next in this section were designed precisely in response to the concerns that may arise with the type of recall data that is transmitted in oral history societies, and draw mostly on the methodology developed in Sanchez de la Sierra (2019).

First, it is well known in the cognitive sciences that as the time period of recall widens, self-reported answers from the past converge to the mean of the real distribution (Tourangeau, Rips, and Rasinski 2000b,a). This implies that the magnitude of measurement error increases

[1] Classical error decreases precision and can lead to bias in linear probability models (Hausman 2001).

[2] Scott (2009) discusses oral history traditions.

Table B.12: Impact of indirect and direct rule exposure on today's support towards the chief - Implicit association tests

VARIABLES	(1) IAT Chief	(2) IAT Chief	(3) IAT Chief	(4) IAT Chief	(5) IAT Chief	(6) IAT Chief	(7) IAT Chief	(8) IAT Chief	(9) IAT Chief
Indirect tax	0.02								
	(0.04)								
Direct tax	-0.04								
	(0.06)								
Indirect recruit		-0.01							
		(0.03)							
Direct recruit		0.01							
		(0.02)							
Indirect legitimation			-0.01						
			(0.02)						
Direct legitimation			0.02						
			(0.05)						
Indirect admin				0.02					
				(0.02)					
Direct admin				-0.02					
				(0.02)					
Indirect justice					0.02				
					(0.03)				
Direct justice					-0.01				
					(0.01)				
Indirect political						0.03**			
						(0.01)			
Direct political						-0.01			
						(0.01)			
Direct service							0.05		
							(0.17)		
Direct regulation								-0.04	
								(0.03)	
Indirect rule									-0.04
									(0.05)
Direct rule									0.02
									(0.05)
Constant	0.02	-0.01	-0.01	0.01	0.01	-0.04	-0.01	0.03	0.02
	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)	(0.07)	(0.06)	(0.06)	(0.07)
Observations	383	383	383	383	383	383	383	383	383
R-squared	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Armed Group FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Notes: This table shows the OLS regressions of the households' implicit association tests on the indirect rule vectors. All regressions cluster at the village level since there are multiple respondents per village (all other regressions have only one data source per village). Armed group fixed effects are included in all regressions.

Table B.13: Impact of indirect rule exposure on today's support towards the chief - survey self-reported love for chief

VARIABLES	(1) Chief loved	(2) Chief loved	(3) Chief loved	(4) Chief loved	(5) Chief loved	(6) Chief loved	(7) Chief loved	(8) Chief loved	(9) Chief loved
Indirect tax	0.04**								
	(0.02)								
Direct tax	-0.07**								
	(0.03)								
Indirect recruit		-0.03							
		(0.02)							
Direct recruit		0.01*							
		(0.00)							
Indirect legitimation			-0.01						
			(0.01)						
Direct legitimation			0.02*						
			(0.01)						
Indirect admin				0.01*					
				(0.01)					
Direct admin				-0.01					
				(0.01)					
Indirect justice					0.01**				
					(0.00)				
Direct justice					-0.00				
					(0.00)				
Indirect political						0.01**			
						(0.00)			
Direct political						-0.00			
						(0.00)			
Direct service							0.03		
							(0.02)		
Direct regulation								-0.01	
								(0.01)	
Indirect rule									-0.02
									(0.02)
Direct rule									0.01
									(0.02)
Constant	0.98***	0.96***	0.94***	0.96***	0.96***	0.94***	0.94***	0.96***	0.97***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)
Observations	448	448	448	448	448	448	448	448	448
R-squared	0.20	0.08	0.03	0.05	0.02	0.01	0.00	0.01	0.03
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Armed Group FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Notes: This table shows the OLS regressions of the villages' love for the chief on the indirect rule vectors. All regressions include armed group level fixed effects.

for events back in time. The survey data thus likely under-estimates historical volatility and the response to external shocks.[3] Second, bad years are recalled with more mistakes (de Nicola and Gine 2014; Tourangeau, Rips, and Rasinski 2000a).

There are ways to reduce measurement error in recall data. First, researchers in social psychology frequently resort to time cues. Time cues are common knowledge events that are designed to allow the respondent and surveyor to identify the time at which a given reported event occurred. The literature in psychology suggests that times cues substantially reduce measurement error about the timing of events.[4] Second, examining recall data on income, de Nicola and Gine (2014) find that recalling changes is easier than recalling levels. A similar fact is documented for recalling events vs. levels (Kjellsson, Clarke, and Gerdtham 2014). Finally, the literature suggests that male household heads who are the owners of the productive assets provide more accurate responses (de Nicola and Gine 2014). We draw on these lessons before designing safeguards against measurement error during the data collection design in Sanchez de la Sierra (2019) and replicate and extend this methodology in this paper. We describe such safeguards next.[5]

B.3.2 Safeguards against measurement error due to recall

The oral history literature warns against the risk that surveyors may have biases, which could influence how questions are asked, primed, and even how the they are recorded. Training, and all external communications of the project mention that the major objective of the project is to reconstruct the socio-economic history of the province of Sud-Kivu in order to better ground future policy on evidence.

[3] Note that recall data is, on average, correct, since the reported distribution is centered around the true mean.

[4] See, for instance Brown, Shevell, and Rips (1986), and Conway and Bekerian (1987). de Nicola and Gine (2014) compare surveys with and without time cues and find no significant improvement as a result of time cues, but note that irrelevant time cues can increase measurement error.

[5] Another concern with this literature is survivor bias. Since the unit of analysis is the municipality, and municipalities do not disappear over the period of study, this is not the major threat to validity in this paper.

A second risk is the bias of respondents. Drawing on the lessons from the cognitive sciences literature, the survey protocol was designed precisely to safeguard against biases that may arise from eyewitnesses. The data collection activities for one observation were planed to take 7 days, consisting of multiple activities designed to reduce recall error. We designed such activities precisely to address the following concerns: (biased) measurement recall error about what happened by individual respondents; measurement recall error about *when* events happened (telescoping); heterogeneity in response accuracy. First, recall error may be larger for events further in the past, and bad times may be recalled worse. Furthermore, the anthropology literature in turn suggests that the information retained by the elite may have a political agenda. Because the main variables are about a common event, not about individuals, we can rely on triangulation methods used in the qualitative social sciences, which consist of verifying information from multiple sources, and in multiple methods (Rothbauer 2008). Surveyors first collect information directly from a group of 5-10 individuals (including chief, elders, and mining sector experts), who themselves also are trained to triangulate information. These individuals are trained and monitored each of 7 days, and the final gathering of information occurs the last day. In addition, surveyors conduct 8 in-depth surveys in private, 4 hours long with each household. In each household survey, they reconstruct the history of the village during a 4 hours discussion in private with a randomly selected adult.[6] Furthermore, the surveyors every day conduct qualitative surveys with various actors in the village, which they then type in the computer for the researchers to individually verify each observation. Triangulating information from multiple sources allows the surveyors to reduce the measurement error | an application of the law of large numbers to the multiple signals they receive about the municipality's history. In addition, triangulation also allows them to verify information in private from individuals who are not from the elite, since the elite may have its own agenda.[7] This approach allowed

[6]To improve the quality of this information, respondents were allowed to ask for another household member for help about village history facts, but had to remain in private for any other question.

[7]In the reports, surveyors note explanations for patterns in the data and provide descriptions of how the bandits and civilians perceive their relationship. Also, this allows me to wash out the biases that may arise

me to secure that by the end of the week, before the day-long interview with the history specialists, the surveyors had no doubts about the history of the village, including knowledge of what facts may have been sensitive through the intimate conversations with households.[8] Second, de Nicola and Gine (2014) suggest that male respondents who are owners of the assets of production provide more accurate answers. In this context, households are led by household "chiefs", who are the owners of the households productive assets. To take advantage of this, we administered the 8 household surveys exclusively on adult male respondents. Third, to improve the precision of reported dates, we instructed the surveyors to implement an exhaustive set of time cues to reduce measurement error associated with the years. The time cues reflect well-known historical events that affected the whole region and that were fine-tuned for this specfic study of North Kivu. To develop these cues, we consulted surveyors and local experts. Informal evidence suggests this strategy was very effective at identifying years.[9] Finally, since the psychology literature suggests that events and transitions are much easier to recall, and based on Sanchez de la Sierra (2019), the survey questionnaire was re-designed so that survey questions focus on transitions, rather than levels, and events easy to memorize. For instance, respondents are not asked to report, every year their wealth, or every year the type of governance in the village. Instead, surveyors asked "Was there ever an organization of security/stationary bandit in this village?" If yes, the surveyor proceeds: "let's begin with the first of these organizations" and first focuses on emphasizing the respondent's memory by identifying well the group and its properties. Convinced that the respondent has narrowed down her imagination onto such stationary bandit episode and the resulting governance arrangements, the surveyor then proceeds to ask about when the group started, and which years it begun which governance activity.[10]

---

if the elite particularly benefited from the shock and was able to recall events around the shock better.

[8] An important cultural factor that may limit the replicability of this study in civil war contexts outside the Congo is that individuals are extremely communicative, especially about armed groups.

[9] A respondent may not know the year at which she got married, but she always knows if it was after Mobutu, and before the RCD took Bukavu, in which case it could only be 1997.

[10] Once the memory of one group was activated, the "marginal cost" of recalling additional events about that group was close to zero, but transitioning between groups was the costliest and could exhaust respondents

By the end of the week of data collection in each municipality, learning was so effective that additional sources brought basically no change in our priors.

B.3.3 Measuring the measurement error due to recall

Sanchez de la Sierra (2019) benchmarked the data collected to data collected using other existing sources of knowledge, including knowledge from historians as well as the ACLED datasets. Figures B.3 plots the survey-based measures of armed groups' presence collected in this study, and pooled with the same data as collected in the foundational Sud Kivu study. Figure B.11 plots attacks measured in the Sud Kivu study on years. Both figures show that the data reflect perfectly the well-known phases of the DRC conflict.[11]

Second, using the attacks data of the Sud Kivu study Sanchez de la Sierra (2019) took advantage of an alternative, data source for violent events, ACLED.[12], Sanchez de la Sierra (2019) assigns the number of attacks recorded that year in ACLED in the proximity of the municipality, for each municipality*year observation.[13] Sanchez de la Sierra (2019) compares this data to the survey data on attacks at the municipality graphically. Figure B.11 shows that the ACLED dataset systematically reports *less* battles than the Sud Kivu survey, and that such gap is especially strong during the Second Congo War. The ACLED data seems to under-report the most important waves of the conflict. This provides additional confidence in the precision of this data.[14] Having matched the two data sources, Sanchez de la Sierra

quickly.

[11]For a detailed description, see Sanchez de la Sierra (2019).

[12]This dataset has been used for the DRC context, notably by Maystadt et al. (2014), Koenig et al. (2017), and Parker and Vadheim (2016)

[13]Geo-coded violent events of ACLED were assigned to circles of varying diameter around the survey municipalities. ACLED data focuses on violent events and is based on news reports. The ACLED dataset contains 3,500 violence events since 1997, coded by type of event. When an event falls in circles of more than one village, event was assigned to all corresponding villages. ACLED reports details about the type of event. To construct the variable "attack" from ACLED, the total of events recorded by ACLED were taken, and all events that are not attacks for each year*village observation were subtracted. The non-violent events are: strategic movements, riots, non violent transfer of territory, non violent events, and whether an armed changes headquarters.

[14]The attacks data are currently being cleaned. An updated figure will include the North Kivu data.

(2019) also addressed measurement error issues formally in a regression framework, and estimated that there is basically no bias in the survey data to examine the effect of shocks in the past, as compared to the benchmark of the ACLED data.[15]

[15]For a detailed discussion, see Sanchez de la Sierra (2019).

C | Appendix to Chapter 3

Table C.1: Robustness of interaction

	(1) Z-Score	(2) Z-Score	(3) Z-Score	(4) Z-Score
Program	0.0544	0.0452	-0.156**	0.0437
	(0.0352)	(0.0334)	(0.0789)	(0.0503)
1.Intensity × Program	-0.100*		0.0698	
	(0.0556)		(0.0860)	
2.Intensity × Program	-0.0824**		0.300***	
	(0.0368)		(0.0892)	
Program × c.Intensity		-0.0376**		-0.00657
		(0.0178)		(0.0273)
Program × Aligned with State			0.101	-0.0303
			(0.0837)	(0.0723)
1.Intensity × Program × Aligned with State			0.0103	
			(0.110)	
2.Intensity × Program × Aligned with State			-0.0893	
			(0.0984)	
Program × Aligned with State × c.Intensity				-0.0483
				(0.0388)
Observations	123910	123910	106401	116490
R^2	0.444	0.444	0.903	0.540
Mean of Outcome	0.00331	0.00331	1.715	0.00431
SD of Outcome	0.714	0.714	0.912	0.711
Min of Outcome	-7.252	-7.252	1	-7.252
Max of Outcome	11.70	11.70	3	11.70
1.Intensity × Post + 1.Intensity × Post × Aligned			0.0801	
			(0.0699)	
2.Intensity × Post + 2.Intensity × Post × Aligned			0.210***	
			(0.0453)	
c.Intensity × Post + c.Intensity × Post × Aligned				−0.0548**
				(0.0271)

Notes: This table shows the regression results of the main specification using program indicators of state capacity and overall public service delivery as outcomes. An observation represents a program indicator in a municipality in a year. The main independent variable, *Program*, is an indicator variable that equals one for each year after the municipality has entered the program. The specification includes state-year-indicator and municipality-indicator fixed effects. Column (1) interacts *Program* with a non-parametric version of the certified status of the indicator in the first year the municipality participated in the program, column (2) uses a linear version instead. Columns (3) and (4) use the same specifications as (1) and (2) but also include an interaction for whether the municipality is governed by the same party as the state. Standard errors, clustered at the municipality level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C.2: Regression results using state capacity as outcomes and different coding

Panel A: No Interaction	*Dependent variable:* Z-Score				
	(1)	(2)	(3)	(4)	(5)
	Index	Dummy 1st cutoff	Dummy 2nd cutoff	Winsorized 99	Winsorized 95
Program	-0.0135	-0.0284**	-0.00756	-0.0206	-0.0207
	(0.0146)	(0.0145)	(0.0143)	(0.0149)	(0.0149)
Observations	124984	125000	125091	125024	125024
R^2	0.425	0.408	0.425	0.461	0.462
Panel B: Interaction with Alignment	*Dependent variable:* Z-Score				
	(1)	(2)	(3)	(4)	(5)
	Index	Dummy 1st cutoff	Dummy 2nd cutoff	Winsorized 99	Winsorized 95
Program	0.0197	-0.00997	0.0308	-0.00263	-0.00244
	(0.0225)	(0.0221)	(0.0226)	(0.0231)	(0.0231)
Program × Aligned with State	-0.0841***	-0.0651**	-0.0881***	-0.0585*	-0.0590*
	(0.0317)	(0.0312)	(0.0314)	(0.0324)	(0.0324)
Observations	119310	119327	119422	119352	119352
R^2	0.514	0.500	0.514	0.547	0.547
Panel C: Interaction with Low Baseline	*Dependent variable:* Z-Score				
	(1)	(2)	(3)	(4)	(5)
	Index	Dummy 1st cutoff	Dummy 2nd cutoff	Winsorized 99	Winsorized 95
Program	0.0544	0.0503	0.0565*	0.0496	0.0500
	(0.0352)	(0.0352)	(0.0338)	(0.0377)	(0.0376)
Low baseline × Program	-0.0837**	-0.0993***	-0.0779**	-0.0878**	-0.0883**
	(0.0366)	(0.0370)	(0.0352)	(0.0391)	(0.0391)
Observations	123910	123926	124018	123950	123950
R^2	0.444	0.428	0.443	0.480	0.480
FE	Year & Mun	Year & Mun	Year & Mun	Year & Mun	Year & Mun
Cluster	Mun	Mun	Mun	Mun	Mun
Mean of Outcome	0.00331	0.00273	0.00296	0.00446	0.00446
SD of Outcome	0.714	0.705	0.714	0.732	0.732
Min of Outcome	-7.252	-12.00	-4.719	-4.719	-4.719
Max of Outcome	11.70	11.70	11.70	11.70	11.70

Table C.3: Linking indicators to outcomes

Indicator	Variable	Source	Coding
1.1 Administered responsibly	Percentage women of total employees	Municipal Census	Standardized (Mean 0, SD 1)
	Does the municipality have an evaluation sector?	Municipal Census	Standardized
	Percentage of administrative personnel of total employees	Municipal Census	Inversed and Standardized
	Own income / Current expenditure	Municipal Budget	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Current expenditure / Total expenses	Municipal Budget	0 if >70%, 1 if >50% and <70%, 2 if <50%
	Public investment / Total income	Municipal Budget	0 if <25%, 1 if >25% and <50%, 2 if >50%
	Personal services / Current expenditure	Municipal Budget	0 if >70%, 1 if >50% and <70%, 2 if <50%
	Total expenses + Total revenue	Municipal Budget	Winsorized at 99%
1.2 Associated and linked	Whether the municipality has partnered with another municipality in the state for public good provision	Municipal Census	Standardized
	Has the municipality made contributions to intermunicipal agreements	Municipal Census	Standardized
1.4 Participatory	Whether the administrative structure has a sector for promoting social participation	Municipal Census	Standardized
	Whether the commissions and/or communal committees participate in the allocation	Municipal Census	Standardized
	Index for regulations for participation	Municipal Census	0 if no reg. 1 if updated 3-5 years ago, 2 if updated in last 3 years
	Are there mechanisms for citizens participation?	Municipal Census	Standardized
1.5 Fiscally responsible	Whether the collection of property tax is done by municipality	Municipal Census	Standardized
	Whether values used for the collection of property tax have been updated in the last 2 years	Municipal Census	Standardized
	Own income / Total income	Municipal Budget	Standardized
	Public debt / Total expenses	Municipal Budget	Inversed
	Property tax t / t-1	Municipal Budget	Winsorized at 99%
	Derechos + Productos + Aprovechamientos t/t-1	Municipal Budget	Winsorized at 99%

Linking indicators to outcomes

Indicator	Variable	Source	Coding
1.6 Leader in civil protection	Is there a plan for civil protection?	Municipal Census	Standardized
	Is there a map of risk zones?	Municipal Census	Standardized
	Index for regulations on civil protection	Municipal Census	0 if no regulations, 1 if updated 3-5 years ago, 2 if updated in last 3 years
1.7 Technicized and with Internet	Total number of computers divided by total number of employees	Municipal Census	Standardized
	Does the municipal office have an Internet connection?	Municipal Census	Standardized
1.8 Legally ordered	Is there a juridica?	Municipal Census	Standardized
	What percentage of transport, police, markets, graves, public works, cleaning, butchers, participation, civil protection, cadastre, fire, zoning have regulations	Municipal Census	Standardized
1.9 Effective rule of law	Is there a justice office?	Municipal Census	Standardized
	Is there a juridica?	Municipal Census	Standardized
1.10 Transparent	Is there a institution in the municipality responsible for transparency?	Municipal Census	Standardized
	Does the municipality currently have regulations to regulate access to public information?	Municipal Census	Standardized
	Does the municipality currently have a public servant responsible for dealing with requests for public information in each of the institutions?	Municipal Census	Standardized
	A system of reception of and attention to public information requests	Municipal Census	Standardized
	A system or procedures of organization, protection, and maintenance of archives	Municipal Census	Standardized
	Training program for public servants on the rights and obligations of access to public information	Municipal Census	Standardized
	Is there open access?	Municipal Census	Standardized
	Are there regulations about transparency?	Municipal Census	Standardized
1.11 Healthy finances	Debt accumulated from previous years	Municipal Census	Inversed, Logged and Standardized
	Percentage of budgeted contributions collected	Municipal Census	Standardized
	Federal participations / Total income	Municipal Budget	0 if >95%, 1 if <95% and >75%, 2 if <75%

Linking indicators to outcomes

Indicator	Variable	Source	Coding
2.1 Innovator of economic alternatives	Is there someone responsible for economic development?	Mun. Census	Standardized
	Are there regulations for econonomic development?	Mun. Census	Standardized
3.1 Provider of services	Percentage of municipal capital covered by drainage and sewage system	Mun. Census	Standardized
	Percentage of rest of municipality covered by drainage and sewage system	Mun. Census	Standardized
	Percentage of municipal capital covered by public lighting	Mun. Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Percentage of rest of municipality covered by public lighting	Mun. Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Percentage of municipal capital covered by street cleaning	Mun. Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Percentage of rest of municipality covered by street cleaning	Mun. Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Percentage of municipal capital covered by trash collection	Mun. Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Percentage of rest of municipality covered by trash collection	Mun. Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Are there grave regulations?	Mun. Census	Standardized
	Are there market regulations?	Mun. Census	Standardized
3.2 Promoter of sport	Do regulations on performance and sport exist?	Mun. Census	Standardized
	Index for regulations on performance and sport	Mun. Census	0 if no regulations, 1 if updated 3-5 years ago, 2 if updated in last 3 years
3.6 Healthy	Percentage of municipal capital covered by drinking water	Mun. Census	0 if 0%, 1 if >0% and <100%, 2 if 100%
	Percentage of rest of municipality covered by drinking water	Mun. Census	0 if 0%, 1 if >0% and <100%, 2 if 100%
	Percentage of municipal capital covered by drainage and sewage system	Mun. Census	0 if 0%, 1 if >0% and <90%, 2 if >90%
	Percentage of rest of municipality covered by drainage and sewage system	Mun. Census	0 if 0%, 1 if >0% and <90%, 2 if >90%
3.8 With decent housing	Percentage of municipal capital covered by drinking water	Mun. Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Percentage of rest of municipality covered by drinking water	Mun. Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Percentage of municipal capital covered by drainage and sewage system	Mun. Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Percentage of rest of municipality covered by drainage and sewage system	Mun. Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Occupants in homes with drainage and / or toilet	Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Occupants in homes with electric power	Census	0 if <50%, 1 if >50% and <75%, 2 if >75%
	Occupants in houses with dirt floor	Census	0 if >30%, 1 if >14% and <30%, 2 if <14%
	Housing without overcrowding	Census	Standardized

Bibliography

Acemoglu, Daron. 2005. "Politics and economics in weak and strong states." *Journal of Monetary Economics* 40 (135): 1199-1226.

Acemoglu, Daron, García-Jimeno Camilo, and James A. Robinson. 2015. "State Capacity and Economic Development: A Network Approach." *American Economic Review* 105 (8): 2364–2409.

Acemoglu, Daron, Isaías N. Chaves, Philip Osafo-Kwaako, and James A. Robinson. 2014. "Indirect Rule and State Weakness in Africa: Sierra Leone in Comparative Perspective." Working Paper.

Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91 (5): 1369–1401.

Acemoglu, Daron, Suresh Naidu, Pascual Restrepo, and James Robinson. 2019. "Democracy does cause growth." *Journal of Political Economy* 137 (1): 47–100.

Acemoglu, Daron, Tristan Reed, and James A. Robinson. 2014. "Chiefs: Economic Development and Elite Control of Civil Society in Sierra Leone." *Journal of Political Economy* 122 (2): 319–368.

Acker, Frank Van. 2005. "Where Did All the Land Go? Enclosure & Social Struggle in Kivu (DR Congo)." *Review of African Political Economy* 32 (103): 79–98.

Afrobarometer. 2017. "Afrobarometer Data, Rounds 3-6." available at `http://www.afrobarometer.org`.

Aguirre, Jerjes, and Hugo Amador Herrera. 2013. "Institutional weakness and organized crime in Mexico: the case of Michoacán." *Trends in Organized Crime* 16 (2): 221–238.

Alegana, Victor A., Jim A. Wright, Uusiku Pentrina, Abdisalan M. Noor, Robert W. Snow, and Peter M. Atkinson. 2012. "Spatial Modelling of Healthcare Utilisation for Treatment of Fever in Namibia." *International Journal of Health Geographics* 11 (1): 1–13.

Ansoms, An. 2009. "Re-Engineering Rural Society: The Visions and Ambitions of the Rwandan Elite." *African Affairs* 108 (431): 289–309.

Arjona, Ana, Nelson Kasfir, and Zachariah Cherian Mampilly. 2017. *Rebel governance in civil war*. New York: Cambridge University Press.

Armstrong, Timothy B., and Michal Kolesar. 2017. "A Simple Adjustment for Bandwidth Snooping." *Review of Economics and Statistics* 85 (2): 732–765.

Ayittey, George. 1991. *Indigenous African Institutions*. Ardsley, N.Y.: Transnational Publishers.

Baldwin, Kate. 2013. "Why Vote with the Chief? Political Connections and Public Goods Provision in Zambia." *American Journal of Political Science* 57 (4): 794–809.

Baldwin, Kate. 2014. "When Politicians Cede Control of Resources: Land, Chiefs, and Coalition-Building in Africa." *Comparative Politics* 46 (3): 253–271.

Baldwin, Kate. 2016. *The Paradox of Traditional Chiefs in Democratic Africa*. New York: Cambridge University Press.

Baldwin, Kate, and Eric Mvukiyehe. 2015. "Elections and Collective Action: Evidence from Changes in Traditional Institutions in Liberia." *World Politics* 67 (4): 690–725.

Baldwin, Kate, and Pia Raffler. 2018. "Traditional Leaders, Service Delivery and Electoral Accountability." In *Decentralization*, ed. Jonathan Rodden and Erik Wibbels. USAID.

Baldwin, Kate, Shylock Muyengwa, and Eric Mvukiyehe. 2017. "Reforming Village-Level Governance via Horizontal Pressure: Evidence from an Experiment in Zimbabwe." Policy Research Working Paper 7941.

Banerjee, Abhijit V., Esther Duflo, and Rachel Glennerster. 2008. "Putting a band-aid on a corpse: incentives for nurses in the Indian public health care system." *Journal of the European Economic Association* 6 (2-3): 487–500.

Bardhan, Pranab, and Dilip Mookherjee. 2006. *Decentralization and Local Governance in Developing Countries: A Comparative Perspective*. Vol. 1 Cambridge, MA: MIT Press.

Bates, Robert H. 1983. *Essays on the Political Economy of Rural Africa*. Berkeley: University of California Press.

BenYishay, Ariel, Renee Rotberg, Jesicca Wells, Zhonghui Lv, Seth Goodman, Lidia Kovacevic, and Dan Runfola. 2017. "Geocoding Afrobarometer Rounds 1 - 6: Methodology & Data Quality. AidData." available at `http://geo.aiddata.org`.

Besley, Timothy, and Masayuki Kudamatsu. 2006. "Health and Democracy." *American Economic Review* 96 (2): 313–318.

Besley, Timothy, and Torsten Persson. 2009. "The Origins of State Capacity: Property Rights, Taxation, and Politics." *American Economic Review* 99(4): 1218–1244.

Besley, Timothy, and Torsten Persson. 2010. "State Capacity, Conflict, and Development." *Econometrica* 78(1): 1-34.

Besley, Timothy, Torsten Persson, and Daniel Sturm. 2010. "Political Competition, Policy and Growth: Theory and Evidence from the United States." *Review of Economic Studies* 77(4): 1329–1352.

Bluemke, Matthias, and Malte Friese. 2008. "Reliability and Validity of the Single-Target IAT (STIAT): Assessing Automatic Affect Toward Multiple Attitude Objects." *European Journal of Social Psychology* 38: 977-997.

Boone, Catherine. 2003. *Political Topographies of the African State: Territorial Authority and Institutional Choice*. Cambridge: Cambridge University Press.

Boone, Catherine. 2014. *Property and Political Order in Africa: Land Rights and the Structure of Politics*. New York: Cambridge University Press.

Boulding, Kenneth Ewart. 1962. *Conflict and Defense: A General Theory*. Vol. 3024 New York: Harper.

Bratton, Michael. 2011. "Violence, Partisanship and Transitional Justice in Zimbabwe." *Journal of Modern African Studies* 49 (3): 353–380.

Brinkerhoff, Derick W, Anna Wetterberg, and Erik Wibbels. 2018. "Distance, Services, and Citizen Perceptions of the State in Rural Africa." *Governance* 31 (1): 103–124.

Brown, Norman R., Steven K. Shevell, and Lance J. Rips. 1986. *Public memories and their personal context*. New York: Cambridge University Press.

Calonico, Sebastian, Matias D. Cattaneo, and Rocio Titiunik. 2014. "Robust Nonparametric Confidence Intervals for Regression-Discontinuity Designs." *Econometrica* 82 (6): 2295–2326.

Campante, Filipe R., and Quoc-Anh Do. 2010. "A Centered Index of Spatial Concentration: Expected Influence Approach and Application to Population and Capital Cities." Working Paper.

Campante, Filipe R., and Quoc-Anh Do. 2014. "Isolated Capital Cities, Accountability, and Corruption: Evidence from US States." *American Economic Review* 104 (8): 2456–2481.

Campante, Filipe R., Quoc-Anh Do, and Bernardo Guimares. 2017. "Capital Cities, Conflict, and Misgovernance." Working Paper.

Carlson, Elizabeth, and Brigitte Seim. 2017. "Honor Among Chiefs: An Experiment on Monitoring and Diversion Among Traditional Leaders in Malawi." Working Paper.

Castañeda, Luis César, and Juan E. Pardinas. 2012. "Sub-national Revenue Mobilization in Mexico." Inter-American Development Bank Working Papers, No. IDB-WP-354.

Centeno, Miguel Angel. 1997. "Blood and Debt: War and Taxation in Nineteenth-Century Latin America." *American Journal of Sociology* 102 (6): 1565-1605.

Chandler, Tertius. 1987. *Four Thousand Years of Urban Growth: An Historical Census*. Lewiston, N.Y.: St. David's University Press.

Chemouni, Benjamin. 2014. "Explaining the Design of the Rwandan Decentralization: Elite Vulnerability and the Territorial Repartition of Power." *Journal of Eastern African Studies* 8 (2): 246–262.

Chong, Alberto, Ana De La O, Dean Karlan, and Leonard Wantchekon. 2015. "Does Corruption Information Inspire the Fight or Quash the Hope? A Field Experiment in Mexico on Voter Turnout, Choice and Party Identification." *Journal of Politics* 77 (1): 55–71.

Chrétien, Jean-Pierre. 2000. *L'Afrique des Grands Lacs. Deux mille ans d'histoire*. Paris: Aubier.

Clayton, Amanda, Jennifer Noveck, and Margaret Levi. 2015. "When Elites Meet: Decentralization, Power-Sharing, and Public Goods Provision in Post-Conflict Sierra Leone." Policy Research Working Paper 7335.

Conway, M.A., and D.A. Bekerian. 1987. "Organization in autobiographical memory." *Memory and Cognition* 119 (15(2)).

Crowder, Michael. 1968. *West Africa Under Colonial Rule*. London: Hutchinson.

Curtin, Kevin M., Hayslett-McCall Karen, and Fang Qiu. 2010. "Determining Optimal Police Patrol Areas with Maximal Covering and Backup Covering Location Models." *Networks and Spatial Economics* 10 (1): 125–145.

de Kadt, Daniel, and Horacio Larreguy. 2018. "Agents of the Regime? Traditional Leaders and Electoral Behavior in South Africa." *Journal of Politics* 80 (2): 382–399.

de Nicola, Francesca, and Xavier Gine. 2014. "How accurate are recall data? Evidence from coastal India." *Journal of Development Economics* 106: 52-65.

Dell, Melissa. 2010. "The Persistent Effects of Peru's Mining Mita." *Econometrica* 78 (6): 1863–1903.

Dell, Melissa. 2015. "Trafficking Networks and the Mexican Drug War." *American Economic Review* 105 (6): 1738–79.

Dell, Melissa, Nathaniel Lane, and Pablo Querubin. 2018. "The Historical State, Local Collective Action, and Economic Development in Vietnam." *Econometrica* (Forthcoming).

Díaz-Cayeros, Alberto, Beatriz Magaloni, and Alexander Ruiz-Euler. 2014. "Traditional Governance, Citizen Engagement, and Local Public Goods: Evidence from Mexico." *World Development* 53: 80–93.

Diaz-Cayeros, Alberto, Federico Estevez, and Beatriz Magaloni. 2016. *The political logic of poverty relief: electoral strategies and social policy in Mexico*. Cambridge: Cambridge University Press.

Dube, Arindrajit, T. William Lester, and Michael Reich. 2010. "Minimum Wage Effects Across State Borders: Estimates Using Contiguous Counties." *Review of Economics and Statistics* 92 (4): 945–964.

Durante, Ruben, and Emilio Guitérrez. 2015. "Fighting Crime with a Little Help from My Friends: Party Affiliation, Inter-Jurisdictional Cooperation and Crime in Mexico." Working Paper.

Engelbert, Pierre, and Denis Tull. 2013. "République Démocratique du Congo: Terrains disputés (Introduction to special issue of Politique Africaine)." *Politique Africaine* 129.

Englebert, Pierre. 2002. *State Legitimacy and Development in Africa*. Boulder, Colo.: Lynne Rienner Publishers.

Epstein, David, and O'Halloran Sharyn. 1994. "Administrative Procedures, Information, and Agency Discretion." *American Journal of Political Science* 38 (3): 697–722.

Evans, Peter B. 1995. *Embedded Autonomy: States and Industrial Transformation*. Princeton, N.J.: Princeton University Press.

Fergusson, Leopoldo, Horacio Larreguy, and Juan Felipe Riaño. 2018. "Political Competition and State Capacity: Evidence from a Land Allocation Program in Mexico." Working Paper.

Fergusson, Leopoldo, Horacio Larreguy, and Juan Felipe Riaño. 2018. "Political Competition and State Capacity: Evidence from a Land Allocation Program in Mexico." Working Paper.

Flannery, Kent, and Joyce Marcus. 2012. *The Creation of Inequality: how our prehistoric ancestors set the stage for monarchy, slavery, and empire*. Cambridge, MA: Harvard University Press.

Fukuyama, Francis. 2013. "What Is Governance?" *Governance* 26 (3): 347–368.

Fund For Peace. 2013. Failed states Index. Policy report Fund For Peace.

Galasso, Vincenzo, and Tommaso Nannicini. 2011. "Competing on Good Politicians." *American Political Science Review* 105 (1): 79–99.

Gennaioli, Nicola, and Hans-Joachim Voth. 2015. "State Capacity and Military Confict." *The Review of Economic Studies* 82 (4): 1409–1448.

Goldstein, Markus, and Christopher Udry. 2008. "The Profits of Power: Land Rights and Agricultural Investment in Ghana." *Journal of Political Economy* 116 (6): 981–1022.

Gottlieb, Jessica. 2017. "Explaining Variation in Broker Strategies: A Lab-in-the-Field Experiment in Senegal." *Comparative Political Studies* 50 (11): 1556–1592.

Gottlieb, Jessica, Guy Grossman, Horacio Larreguy, and Benjamin Marx. 2018. "The Effect of Administrative Unit Creation on Electoral Behavior: Evidence from Senegal." *Journal of Politics* (Forthcoming).

Gottlieb, Jessica, and Katrina Kosec. 2018. "The Countervailing Effects of Competition on Public Goods Provision: When Bargaining Inefficiencies Lead to Bad Outcomes." Working Paper.

Greenwald, A. G., D. E. McGhee, and J. L. K. Schwartz. 1998. "Measuring individual differences in implicit cognition: The Implicit Association Test." *Journal of Personality and Social Psychology* 74: 1464–1480.

Greif, Avner. 2008. "Towards a political economy of implementation." In *Institutions and economic performance*, ed. Elhanan Helpman. Cambridge: Harvard University Press.

Grossman, Guy, and Janet I. Lewis. 2014. "Administrative Unit Proliferation." *American Political Science Review* 108 (1): 196–217.

Hatfield, John William, and Katrina Kosec. 2013. "Federal Competition and Economic Growth." *Journal of Public Economics* 93 (1): 144–159.

Hausman, Jerry. 2001. "Mismeasured Variables in Econometric Analysis: Problems from the Right and Problems from the Left." *The Journal of Economic Perspectives* 15 (4): 57-67.

Hechter, Michael, and Nika Kabiri. 2010. "Attaining social order in Iraq." In *Order, Conflict, and Violence*, ed. Stathis N. Kalyvas, Ian Shapiro, and Tarek Masoud. Cambridge: Cambridge University Press.

Hendrix, Cullen S. 2010. "Measuring State Capacity: Theoretical and Empirical Implications for the Study of Civil Conflict." *Journal of Peace Research* 47 (3): 273–285.

Henn, Soeren J., Gauthier Marchais, and Raul Sanchez de la Sierra. 2018. "Indirect Rule: Evidence from Armed Groups in Eastern Congo." Working Paper.

Herbst, Jeffrey. 2000. *States and Power in Africa: Comparative Lessons in Authority and Control*. Princeton, N.J.: Princeton University Press.

Hoffmann, K. 2014. *Ethnogovernmentality: The Making of Ethnic Territories and Subjects in Eastern Congo : Ph.D. Dissertation*. Doctoral School of Society and Globalisation, Department of Society and Globalisation, Roskilde University.

Hoffmann, Kasper, Koen Vlassenroot, and Gauthier Marchais. 2016. "Taxation, Stateness and Armed Groups: Public Authority and Resource Extraction in Eastern Congo." *Development and Change* 47 (6): 1434–1456.

Holmes, Thomas J. 1998. "The Effect of State Policies on the Location of Manufacturing: Evidence from State Borders." *Journal of Political Economy* 106 (4): 667–705.

Holzinger, Katharina, Florian G. Kern, and Daniela Kromrey. 2016. "The Dualism of Contemporary Traditional Governance and the State: Institutional Setups and Political Consequences." *Political Research Quarterly* 69 (3): 469–481.

Honig, Lauren. 2017. "Selecting the State or Choosing the Chief? The Political Determinants of Smallholder Land Titling." *World Development* 100: 94–107.

Imbens, Guido, and Karthik Kalyanaraman. 2012. "Optimal Bandwidth Choice for the Regression Discontinuity Estimator." *Review of Economics and Statistics* 79 (3): 933–959.

Ingelaere, Bert. 2010. "Peasants, Power and Ethnicity: A Bottom-Up Perspective on Rwanda'S Political Transition." *African Affairs* 109 (435): 273–292.

Jedwab, Remi, and Alexander Moradi. 2015. "The Permanent Effects of Transportation Revolutions in Poor Countries: Evidence from Africa." *Review of Economics and Statistics* 98 (2): 268–284.

Kalyvas, Stathis N. 2006. *The Logic of Violence in Civil War*. New York: Cambridge University Press.

Keele, Luke, and Rocio Titiunik. 2015. "Geographic Boundaries as Regression Discontinuities." *Political Analysis* 23 (1): 127–155.

Keele, Luke, and Rocio Titiunik. 2016. "Natural Experiments Based on Geography." *Political Science Research and Methods* 4 (1): 65–95.

Kiszewski, Anthony, Andrew Mellinger, Andrew Spielman, Pia Malaney, Sonia Ehrlich Sachs, and Jeffrey Sachs. 2004. "A Global Index Representing the Stability of Malaria Transmission." *American Journal of Tropical Medicine and Hygiene* 70 (5): 486–498.

Kjellsson, Gustav, Philip Clarke, and Ulf-G. Gerdtham. 2014. "Forgetting to remember or remembering to forget: A study of the recall period length in health care survey questions." *Journal of Health Economics* 35: 34 - 46.

Knutsen, Carl Henrik, Andreas Kotsadam, Eivind Hammersmark Olsen, and Tore Wig. 2017. "Mining and Local Corruption in Africa." *American Journal of Political Science* 61 (2): 320–334.

Koenig, Michael, Dominic Rohner, Mathias Thoenig, and Fabrizio Zilibotti. 2017. "Networks in Conflict: Theory and Evidence from the Great War of Africa." *Econometrica* 85 (4): 1093–1132.

Koter, Dominika. 2013. "King Makers: Local Leaders and Ethnic Politics in Africa." *World Politics* 65 (2): 187–232.

Krishna, Anirudh, and Gregory Schober. 2014. "The Gradient of Governance: Distance and Disengagement in Indian Villages." *Journal of Development Studies,* 50 (6): 820–838.

LaPorta, Rafael, Florencio Lopez-de Silanes, Andrei Shleifer, and Robert Vishny. 1999. "The Quality of Government." *Journal of Law, Economics, and Organization* 15 (1): 222–279.

Larreguy, Horacio, John Marshall, and James M. Snyder. 2018. "Publicizing Malfeasance: How Local Media Faciliates Electoral Sanctioning of Mayors in Mexico." Working Paper.

LeBas, Adrienne. 2006. "Polarization as Craft: Party Formation and State Violence in Zimbabwe." *Comparative Politics* 38 (4): 419–438.

Lee, Melissa M., and Nan Zhang. 2017. "Legibility and the Informational Foundations of State Capacity." *Journal of Politics* 79 (1): 118–132.

Logan, Carolyn. 2009. "Selected Chiefs, Elected Councillors and Hybrid Democrats: Popular Perspectives on the Co-Existence of Democracy and Traditional Authority." *Journal of Modern African Studies* 47 (1): 101–128.

Logan, Carolyn. 2013. "The Roots of Resilience: Exploring Popular Support for African Traditional Authorities." *African Affairs* 112 (448): 353–376.

Lowes, Sara, Nathan Nunn, James A. Robinson, and Jonathan Weigel. 2015. "Understanding ethnic identity in Africa: Evidence from the Implicit Association Test (IAT)." *American Economic Review Papers and Proceedings* 105 (5): 340–345.

Lowes, Sara, Nathan Nunn, James A. Robinson, and Jonathan Weigel. 2017. "The Evolution of Culture and Institutions: Evidence from the Kuba Kingdom." *Econometrica* 85 (4): 1065–1091.

Lund, Christian. 2003. "'Bawku is Still Volatile': Ethno-Political Conflict and State Recognition in Northern Ghana." *Journal of Modern* 41 (4): 587–610.

Mamdani, Mahmood. 1996. *Citizen and Subject: Contemporary Africa and the Legacy of Late Colonialism*. Princeton, N.J.: Princeton University Press.

Mamdani, Mahmood. 2012. *Define and Rule: Native as Political Identity*. Cambridge, MA: Harvard University Press.

Mamphilly, Zachariah Cherian, ed. 2011. *Rebel Rulers: Insurgent Governance and Civilian Life during War*. Ithaca, NY: Cornell University Press.

Mani, Anandi, and Sharun Mukand. 2007. "Democracy, Visibility and Public Good Provision." *Journal of Development Economics* 83 (2): 506–529.

Marx, Benjamin. 2018. "Elections as Incentives: Project Completion and Visibility in African Politics." Working Paper.

Maystadt, Jean-François, Giacomo De Luca, Petros G. Sekeris, and John Ulimwengu. 2014. "Mineral resources and conflicts in DRC: a case of ecological fallacy?" *Oxford Economic Papers* 66 (3): 721-749.

Michalopoulos, Stelios, and Elias Papaioannou. 2013. "Pre-colonial Ethnic Institutions and Contemporary African Development." *Econometrica* 81 (1): 113–152.

Michalopoulos, Stelios, and Elias Papaioannou. 2014. "National Institutions and Subnational Development in Africa." *Quarterly Journal of Economics* 129 (1): 151–213.

Migdal, Joel S. 1988. *Strong Societies and Weak States: State-Society Relations and State Capabilities in the Third World*. Princeton, N.J.: Princeton University Press.

Miguel, Edward. 2004. "Tribe or Nation: Nation Building and Public Goods in Kenya versus Tanzania." *World Politics* 56: 327–62.

Miles, William F. S. 1993. "Traditional Rulers and Development Administration: Chieftaincy in Niger, Nigeria, and Vanuatu." *Studies in Comparative International Development* 28 (3): 31–50.

Miller, Norman N., and Elliot P. Skinner. 1968. "The Political Survival of Traditional Leadership: The 'Paradox' of Rural Leadership: A Comment." *Journal of Modern African Studies* 6 (2): 183–201.

Mokgobi, Maboe. G. 2014. "Understanding Traditional African Healing." *African Journal for Physical Health Education, Recreation, and Dance* 20 (Suppl 2): 24–34.

Morvan, Helene. 2005. *Reinventer le quotidien: la cohabitation des populations civiles et des combattants Mai-Mai au Kivu*. Uppsala Life and Peace Institute.

Naidu, Suresh. 2012. "Suffrage, Schooling, and Sorting in the Post-Bellum U.S. South." Working Paper.

Nath, Anusha. 2015. "Bureaucrats and Politicians: How Does Electoral Competition Affect Bureaucratic Performance?" Working Paper.

Ncube, Godfrey Tabona. 2011. "Crisis of Communal Leadership: Post-Colonial Local Government Reform and Administrative Conflict with Traditional Authorities in the Communal Areas of Zimbabwe, 1980-2008." *African Journal of History and Culture* 3 (6): 89–95.

Nest, Michael. 2011. *Coltan*. Cambridge, UK: Polity Press.

Newbury, David. 1992. *Kings and Clans: Ijwi Island and the Lake Kivu Rift, 1780–1840*. Madison: University of Wisconsin Press.

Newbury, David. 2009. *The Land Beyond the Mists: Essays on Identity and Authority in Precolonial Congo and Rwanda*. Athens, OH: Ohio University Press.

Nosek, B. A., A. G. Greenwald, and M. R. Banaji. 2006. "The Implicit Association Test at age 7: A methodological and conceptual review." In *Social psychology and the unconscious: The automaticity of higher mental processes*, ed. J. A. Bargh. New York: Psychology Press.

Nuesiri, Emmanuel O. 2014. "The Re-Emergence of Customary Authority and its Relation to Local Democratic Government." Working Paper.

Nunn, Nathan. 2010. "Religious Conversion in Colonial Africa." *American Economic Review* 100 (2): 147–152.

Nunn, Nathan, and Diego Puga. 2012. "Ruggedness: The Blessing of Bad Geography in Africa." *Review of Economics and Statistics* 94 (1): 20–36.

Nunn, Nathan, and Leonard Wantchekon. 2011. "The Slave Trade and the Origins of Mistrust in Africa." *American Economic Review* 101 (7): 3221–3252.

Olken, Benjamin A, and Monica Singhal. 2011. "Informal Taxation." *American Economic Journal: Applied Economics* 3 (4): 1–28.

Padró I Miquel, Gerard, and Pierre Yared. 2012. "The Political Economy of Indirect Control." *The Quarterly Journal of Economics* 127 (2): 947-1015.

Parker, Dominic P., and Bryan Vadheim. 2016. "Resource Cursed or Policy Cursed? U.S. Regulation of Conflict Minerals and Violence in the Congo." *Journal of the Association of Environmental and Resource Economics* 4 (1): 1–49.

Pérez Archudia, Eduardo, and Ernesto de Jesús Arenas Aréchiga. 2012. "Agenda desde lo Local: Desarrollo Sostenible y Desarrollo Humano." *Revista Austral de Ciencias Sociales* 2: 43–54.

Purdeková, Andrea. 2011. "'Even if I am not here, there are so many eyes': Surveillance and State Reach in Rwanda." *Journal of Modern African Studies* 49 (3): 475–497.

Raffler, Pia. 2018. "Does Political Oversight of the Bureaucracy Increase Accountability? Field Experimental Evidence from an Electoral Autocracy." Working Paper.

Ranger, Terence O. 1983. "The Invention of Tradition in Colonial Africa." In *The Invention of Tradition*, ed. Eric Hobsbawm and Terence O Ranger. Cambridge: Cambridge University Press.

Référentiel Géographique Commun. 2010. Donnees Administratives and Donnees Physiques. Data source Référentiel Géographique Commun. http://www.rgc.cd/.

Rothbauer, Paulette. 2008. "Triangulation." In *The SAGE Encyclopedia of Qualitative Research Methods*, ed. Lisa M. Given. London: SAGE Publications.

Sanchez de la Sierra, Raul. 2014. "On the Ends of the State." *Unpublished.*

Sanchez de la Sierra, Raul. 2019. "On the Origin of States: Stationary Bandits and Taxation in Eastern Congo." *Journal of Political Economy* (Forthcoming).

Sandefur, Justin, and Bilal Siddiqi. 2013. "Delivering Justice to the Poor: Theory and Experimental Evidence from Liberia." Working Paper.

Scott, James C. 1998. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed.* New Haven: Yale University Press.

Scott, James C. 2009. *The Art of Not Being Governed: An Anarchist History of Upland Southeast Asia.* New Haven: Yale University Press.

Sheely, Ryan. 2018. "Maintaining Local Public Goods: Evidence from Rural Kenya." Working Paper.

Sklar, Richard L. 1999. "African Politics: The Next Generation." In *State, Conflict, and Democracy in Africa*, ed. Richard Joseph. Boulder, Colo.: Lynne Rienner Publishers.

Soifer, Hillel D. 2012. "Measuring State Capacity in Contemporary Latin America." *Revista De Ciencia Política Santiago* 32 (3): 585–598.

Soifer, Hillel David. 2015. *State Building in Latin America.* New York: Cambridge University Press.

Solé-Ollé, Albert, and Elisabet Viladecans-Marsal. 2012. "Lobbying, political competition, and local land supply: Recent evidence from Spain." *Journal of Public Economics* 96 (1-2): 10–19.

Stasavage, David. 2010. "When Distance Mattered: Geographic Scale and the Development of European Representative Assemblies." *American Political Science Review* 104 (4): 625–643.

Stearns, Jason. 2011. *Dancing in the Glory of Monsters*. New York, NY: Public Affairs.

Stearns, Jason, and Christoph Vogel. 2015. *The Landscape of Armed Groups in Eastern Congo*. New York: Center on International Cooperation at New York University.

Suryanarayan, Pavithra. 2017. "Hollowing Out the State: Franchise Expansion and Fiscal Capacity in Colonial India." Working Paper.

Thies, Cameron G. 2005. "War, rivalry, and state building in Latin America." *American Journal of Political Science* 49 (3): 451-465.

Thies, Cameron G. 2007. "The political economy of state building in Sub-Saharan Africa." *Journal of Politics* 69 (3): 716-731.

Tilly, Charles. 1985. "War Making and State Making as Organized Crime." In *Bringing the State Back In*, ed. Theda Skocpol Peter Evans, Dietrich Rueschemeyer. Cambridge: Cambridge University Press.

Tilly, Charles. 1990. *Coercion, Capital, and European States, AD 990–1992*. Cambridge, MA: Basil Blackwell.

Tourangeau, R., L.J. Rips, and K.A. Rasinski. 2000a. *Pillars of Prosperity: The Political Economics of Development Clusters*. New York: Cambridge University Press.

Tourangeau, R., L.J. Rips, and K.A. Rasinski. 2000b. "Remembering what happened: Memory errors and survey reports." In *The science of self-report: Implications for research and practice*, ed. A.A. Stone, J.S. Turkkan, C.A. Bachrach, J.B. Jobe, H.S. Kurtzman, and V.S. Cain. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Tsai, Lily L. 2007. *Accountability Without Democracy: Solidary Groups and Public Goods Provision in Rural China*. Cambridge: Cambridge University Press.

Tull, Denis M. 2003. "A Reconfiguration of Political Order? The State of the State in North Kivu (DR Congo)." *African Affairs* 102 (408): 429–446.

Turrubiates Flores, Héctor Omar, Marco Iván Vargas Cuéllar, and Irma Brígida Suárez Rodríguez. 2014. "Capacidades Institucionales y Problemas Recurrentes: Evidencias de las Verificaciones del Programa Agenda para el Desarrollo Municipal en San Luis Potosí." *Tlatemoani*.

United Nations Security Council. 2002. Final Report of the Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth of the Democratic Republic of Congo. Policy report.

Vansina, Jan. 1978. *The Children of Woot: A History of the Kuba Peoples*. Madison: University of Wisconsin Press.

Vansina, Jan. 2005. *Antecedents to Modern Rwanda: The Nyiginya Kingdom*. Madison: University of Wisconsin Press.

Vaughan, Olufemi. 2006. *Nigerian Chiefs: Traditional Power in Modern Politics, 1890s-1990s*. Vol. 7 Rochester, N.Y.: University Rochester Press.

Verweijen, Judith. 2013. "Military Business and the Business of the Military in the Kivus." *Review of African Political Economy* 40 (March): 67-82.

Voors, Maarten, Ty Turley, Erwin Bulte, Andreas Kontoleon, and John A. List. 2017. "Chief for a Day: Elite Capture and Management Performance in a Field Experiment in Sierra Leone." *Management Science*: 1–22.

Webb, Kieran. 2007. "The Continued Importance of Geographic Distance and Boulding's Loss of Strength Gradient." *Comparative Strategy* 26 (4): 295–310.

Wellenstein, Anna, Angélica Núñez, and Luis Andrés. 2006. "Social Infrastructure: Fondo de Aportaciones para la Infraestructura Social (FAIS)." In *Decentralized service delivery for the poor, Volume II: Background papers*, ed. The World Bank. Mexico City: The World Bank.

Williams, J. Michael. 2010. *Chieftaincy, the State, and Democracy: Political Legitimacy in Post-Apartheid South Africa*. Bloomington: Indiana University Press.

Wood, Elisabeth Jean. 2003. *Insurgent collective action and civil war in El Salvador*. New York: Cambridge University Press.

Zamchiya, Phillan. 2011. "A Synopsis of Land and Agrarian Change in Chipinge District, Zimbabwe." *Journal of Peasant Studies* 38 (5): 1093–1122.

Zartman, William I. 2000. *Traditional Cures for Modern Conflicts: African Conflict 'Medicine'*. Boulder, Colo.: Lynne Rienner Publishers.