

# **Selecting the State or Choosing the Chief? The Political Determinants of Smallholder Land Titling**

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## **Citation**

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## **Abstract**

Land titling has important developmental consequences, but it is not equally desirable or efficient among all smallholder farmers, even within the same communities. Instead, customary institutions shape who benefits from titling—and who resists. Within Sub-Saharan Africa, customary institutions regulate untitled land and play an important role in the daily lives of smallholder farmers. This manuscript examines who titles and why with attention to the individual's status within the customary institution. Analysis of one new and one established geocoded smallholder survey in Senegal and Zambia indicates that, independent of ethnicity, wealth, and land values, households with greater customary privilege are less likely to title their land. Such individuals are slower to exit the customary system of property rights in order to continue benefiting from their high status within the institution. I find support for this mechanism in measures of increased tenure security for those with customary privilege. These findings update the dominant wisdom that land markets and economic efficiency drive smallholder land titling, demonstrating the important effect of status within the customary institution on the decision to title. This contributes to the continuing debate on the efficiency of land titling, in the current era of high demand for African agricultural land. It suggests that smallholders with low customary privilege benefit the most from titling.

**Keywords:** Land titling, land rights, customary tenure, chiefs, Zambia, Senegal, Africa

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# Selecting the State or Choosing the Chief? The Political Determinants of Smallholder Land Titling

## 1 Introduction

As multinational investors, national elites, and urban middle classes rush to claim plots of African land, the debate over land titling becomes increasingly salient. The titling of land—converting it from customary to state property rights—may increase land tenure security, investment incentives, and credit access for smallholder farmers (Deininger and Chamorro 2004; Feder and Noronha 1987; de Soto 2000). Yet researchers have repeatedly found that it is inefficient, with limited impacts on productivity or tenure security (Jacoby and Minten 2007; Atwood 1990; Sitko, Chamberlin, and Hichaambwa 2014). To advance our understanding of the different effects of titling on smallholder livelihoods, this manuscript examines who titles and why. Existing explanations for why smallholder farmers title their land overlook the impact of customary institutions on the individual's decision to exit a system of customary property rights in favor of the state's. While titling may have critical economic effects, its origins are political.

Our current understanding of why smallholders title is that increased competition for land renders customary tenure inefficient. Individuals should seek formal, statutory property rights in response to land markets and land scarcity. Much of the existing scholarship on how titling develops relies on Boserup (1965) as a baseline; she argues that increasing population densities provoke institutional innovations, including a shift in property rights. Following the same logic, a range of factors that increase land values should prompt individuals on customary land to demand titles, “inducing” institutional change in property rights over land (Ahmad 1966; North and Thomas 1973; Platteau 1996). Existing scholarship treats smallholder titling as a response to economic interests and land markets, such that wealthier individuals on higher value land are expected to be the first to title.

However, the smallholder titling decision also reflects the local politics of customary authority. Across Sub-Saharan Africa, customary authorities (CAs) are a pervasive feature of the every day lives of citizens (Baldwin 2015). The resilience of customary authority (Englebert 2002; Ubink 2008) and the widespread popular support they benefit from (Logan 2013) is in part due to their ability to broker social relations within the modern state. Within their communities, CAs and their customary institutions establish different levels of status among individuals. This is critical for the land titling decision because it determines who is more or less invested in the maintenance of customary authority in that location. Smallholders with higher customary privilege should support customary control of land, in order to continue benefiting from their status. In effect, they resist converting their land from customary to state property rights. By contrast, those with low customary privilege propel the land titling process, exiting the customary property rights regime in favor of the protections of the state. In this manuscript, I argue that variation in customary privilege shapes the household's likelihood of titling.

I examine this relationship between customary privilege and titling among smallholder farmers in both Zambia and Senegal, countries with distinct systems of customary authority over land. I rely on one original and one established geo-coded smallholder farmer surveys to identify

how an immutable measure of privilege—kinship with the CA—affects land titling and tenure outcomes. In both country contexts, I find that high privilege in relation to the customary institution decreases the smallholder’s likelihood of titling. I offer support for the theory that this difference is the result of the desire to continue benefiting from high status within the customary institution by showing that privileged smallholders benefit from greater land tenure security. Those with low customary privilege are less likely to fallow their land, a behavior that requires high confidence in the security of one’s property rights. These are the same smallholders that welcome land titling. Qualitative insights and descriptions gleaned from interviews with customary authorities and focus groups inform this theory.

Without accounting for the differences in who seeks titles, our understanding of the consequences of titling are incomplete. This research establishes a new variable for research on why smallholders title and how institutional change in property rights occurs: status within the customary institution. In the following section, I introduce the prevailing approach to who titles their land and the literature that suggests a role for customary institutions. I then present the context of titling and authority in Zambia and Senegal, before proposing a theory of how customary institutions structure privilege within the community, shaping the demand for titles. Section 5 presents the data and methods; Section 6 presents the results of analyses of customary privilege on titling and tenure security in Zambia and Senegal. A discussion of the implications of these results for evolutionary theories of institutional change, the role of the state, and land titling policy concludes.

## **2 Explanations for Land Titling**

Land markets and economic efficiency dominate existing explanations for land titling. A variety of factors increase the value of land, inducing institutional change in property rights (Ahmad 1966; Ruttan and Hayami 1984; North and Thomas 1973). As land becomes more valuable and scarce, actors have incentives to shift to property rights institutions that protect individual ownership of land. Increased competition over the resource and the increased costs of dispute resolution “induce” demand for new property rights institutions. For Boserup, population density is the central variable that makes land scarce (1965). Other formulations of the induced institutional innovation approach highlight a larger set of factors that can increase the value of land, such as the commercialization of crops and transportation networks (Deininger and Feder 2001).

Platteau presents this approach as the Evolutionary Theory of Land Rights (ETLR), drawing attention to the implication that property rights institutions are part of a slow evolution from customary systems to individually titled land (1996; 2000). His framework highlights the importance of transaction costs in the model of institutional change. The costs of institutional change relative to its benefits are lower as land becomes more valuable. As the value of land increases through commercialization and population growth, farmers should be more likely to seek the protections of state titles. In this model of institutional change, lags or discontinuities in titling behavior are the result of imperfections in the market that change the transaction costs of converting land from customary property rights to titles (Platteau 1996).

However, a wide range of political and social factors shape the individual’s choice to demand new forms of property rights. The proponents of induced institutional change themselves

have suggested that ideology and interest groups (Ruttan and Hayami 1984), social norms (Platteau 1996), and economic heterogeneity (Baland and Platteau 1999) may slow institutional change. Greif (1994) and Firmin-Sellers (2000) argue for the influence of culture on this process. For Greif (1994), shared cultural beliefs coordinate expectations of gain from institutional change. For Firmin-Sellers (2000), these cultural beliefs shape actors' understanding of what outcomes are legitimate or their "choice set."

A rich interdisciplinary literature has established that property rights in land are socially-embedded, such that institutional change transforms power relations within the community and the society (Polanyi 1944; Berry 1993; Sikor and Lund 2009). Rural elites should be most resistant to land reforms, as they have the most to lose (Lipton 2009, 151). Specific cases support this. For example, lineage heads in China discourage titling in order to maintain their ability to control local populations (Mattingly 2016). In Ghana, Onoma finds that chiefs reap the benefits of weak property rights regimes of their own creation (2009). While not often viewed as an explicit means of resistance to land titling, the Common Pool Resources school provides plentiful examples of local institutional solutions designed to stop the evolution towards individualized, statutory natural resource rights (Ostrom 1990). Customary authorities resist titling because it cedes their power and autonomy to the state, rendering the land and its occupants "legible" (Scott 1998; Sikor and Lund 2009). That power relations and privilege within the community should condition who seeks institutional change is consistent with much of the scholarship on titling and land reform.

Yet, these literatures have stopped short of theorizing or identifying a systematic effect of customary institutions on who titles their land. I update existing models of evolutionary change in property rights by shifting focus from the drivers of institutional change to the sources of institutional continuity. The decision to title is not only a reflection of the push for change, but the pull to stay within the customary system of property rights. Within a given community, some smallholders maintain customary authority over land by resisting titling, while others embrace it. This manuscript proposes a novel approach to understanding how privilege created by the customary institution shapes the individual decision to title land and pairs it with empirical support from two distinct African country contexts.

### **3 Titling and Customary Authority in Context**

Zambia and Senegal are the country-cases for this study of the effect of customary institutions on land titling outcomes. The two African countries represent a critical and representative variation in customary institution types: whether they are recognized by the state or not (Burr and Kyed 2007). While the CAs in Zambia have constitutionally-recognized control over land, in Senegal the influence of CAs over land allocation is informal. The differences between these two types of customary authority allows me to test whether privilege influences titling outcomes independent of the structure of state-customary relations. As the cases feature different geographies, local customary institutions, colonial histories, and agricultural systems, identifying common patterns in smallholder titling across the two countries contributes to the generalizability of the findings within Africa.

Zambia features state-recognized chiefs with concentrated authority over the land within their chiefdom boundaries. The 286 chiefdoms in Zambia were established through the

codification of ethnic groups and pre-colonial polities by the British colonial authorities. These chiefdom boundaries were preserved throughout the post-independence period. Legally, Zambian chiefs are “the custodians” of customary land. On the land within their jurisdictions, chiefs are responsible for allocation and the adjudication of conflicts. Each of these chiefs oversees village headmen or headwomen, who are often lineage-based appointments but can be selected by the chief. These chiefs and headmen are the salient customary authorities in Zambia.

Legally, and in practice, chiefs must provide written consent for any conversion of land from customary to state property rights. To title rural land in Zambia, the smallholder must bring a letter of consent from the chief to the District Council. This commences the process of permanently converting the land from customary to state property rights. As customary land can have no formal market value there, the costs incurred by the applicant are fees for processing the application and mapping the land. After the District Council approves the application, the smallholder seeking title applies to the Ministry of Land, which issues a title in the form of a 99-year lease with the state. Importantly, even if the title is cancelled, the land cannot revert back to land under customary authority.

Senegal’s customary authorities have no formal role in land allocation, conflict adjudication, or titling but have informal influence over customary land. Two types of customary authorities are important in Senegal. First, village chiefs, who like the chiefs in Zambia, derive legitimacy from ethnicity, clan lineage, and pre-colonial polities. Senegal also features Islamic brotherhood marabouts. Marabouts are leaders from Sufi Islamic brotherhoods who have both “spiritual and temporal authority” over their followers (Villalón 2000, 475). While their authority derives in part from Islam, their political influence distinguishes them from village imams.<sup>1</sup> Marabouts and village chiefs are collaborators within the community. In some cases, they are related.

As Senegal has no formal recognition of a customary authority over land, multiple CAs can play a role in land allocation. The lineage of the village founder, known by the Wolof term *borum/borom dek*, exerts customary authority over the community’s land. Often the title of *borum dek* is synonymous with the village chief, however, at times marabouts can hold this title. This is particularly true of the marabouts who cleared land for their followers (Rocheteau 1975). Within the Senegal sample (detailed in section 5), 84% of households indicated that village chiefs have a role in land administration, and 95% percent of households reported that there is a marabout in their village. However, there is wider range in the influence of marabouts than village chiefs; just 48% of the respondents reported that the marabout had a role in land allocation.

To title customary land in Senegal, known as “Domaine National,” the smallholder farmer must apply through the local Rural Council. As in Zambia, this application must be approved by the Council and the applicant must pay mapping and processing fees before it can proceed to the national land titling process. The approval from the Rural Council is known as Extract of Deliberation. On agricultural land in Senegal, the titling process converts customary

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<sup>1</sup> There is an extended literature on marabouts in Senegal. See Copans (1980); Guèye (2002); Villalón (2006); Beck (2008). Most (90%) Senegalese citizens identify as members of a Sufi brotherhood. Agence Nationale de la Statistique et de la Demographie, Senegal. “Resultats Definitifs Du Troisieme Recensement General de La Population et De l’Habitat.” Dakar: ANSD, 2002.

land by registering it in the state's domain, to establish a lease between the applicant and the state.<sup>2</sup> However, in Senegal the consent of the local customary authority for the new title is not required. The village chief serves as witness to the titling application and, in practice, Rural Councils often follow their recommendations (Traoré 1997, 96; Lavigne Delville 1999, 6). As one Rural Council member reported in an interview, the council is "obliged, not for legality but for legitimacy"<sup>3</sup> to engage the customary authorities in land decisions.

Titling can be costly for the customary institution. It requires the permanent conversion of land out of customary systems of property rights to those of the state. Thus the CA's control over an increasingly valuable natural resource and influence over the primary factor of production for rural citizens decreases with each title. In Zambia, the sentiment among chiefs that land conversions reduce their power<sup>4</sup> and that "the more land I give away, the more power I give away"<sup>5</sup> is pervasive. One chief explained to the media that, "We are worried because you can't be a chief without land."<sup>6</sup> Even in Senegal, where the CAs' role is informal, village chiefs report resistance to titling in their communities. One argued that "I don't need papers for my land. These lands have been our property for centuries."<sup>7</sup> Another reasoned that "Since 700 years we have lived here and never had a problem.... This policy of land registration (*immatriculation*) is hiding an ulterior interest of the government."<sup>8</sup>

With financial expenditures and the costs to the customary institution of land titling, smallholders in Zambia and Senegal have varied levels of interest in land titling. Some identify it as unnecessary: "Us landowners don't need title because it's our land,"<sup>9</sup> or risky: "I don't feel the need to seek out this type of paper because the land already belongs to me. It's a way of calling into question my rights to ownership and usage."<sup>10</sup> Yet for others, it is an important means of promoting land tenure security: "Even if you are poor, you should find the money to get the papers or you will be removed. Sometimes you are even afraid to develop the area for fear that you will be removed. So we would like the Government to come to our rescue so we are safe."<sup>11</sup>

#### **4 A Theory of Customary Privilege and Land Titling**

Land titling is costly, particularly for smallholder farmers who primarily rely on family labor. Acquiring title to one's land requires initiative, payment, and time. Yet there are also benefits for smallholders; a title is a stronger recognition of land ownership in state courts and banks. Given the costs and advantages, why do some smallholders choose to title their land while others remain in the customary system? When we treat titling as a decision to exit a system of property rights adjudicated by a CA in favor of the protections of state property rights, the importance of privilege within the local institutions becomes clear. The smallholder's interest in remaining in

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<sup>2</sup> Nearly all land titles are in the state's name; since 1994 agricultural land is not eligible for private title in Senegal. Loi 96-64 du 22 aout 1994 autorisant la vente des terrains domaniaux à usage industriel et commercial.

<sup>3</sup> Interview RC-109.

<sup>4</sup> Interview CA-644.

<sup>5</sup> Interview CA-507.

<sup>6</sup> 2014. "Draft Land Article Annoys Nkomeshya," *Post* (Lusaka, Zambia), March 12.

<sup>7</sup> Interview CA-110.

<sup>8</sup> Interview CA-149.

<sup>9</sup> Focus Group FFG-543.

<sup>10</sup> Open-ended question response, Senegal Smallholder Survey (2014).

<sup>11</sup> Focus Group FFG-565.

the customary system is tied to the benefits of maintaining customary control of land. By contrast, titling signals lower belief in the credibility of customary property rights institutions and expectation of benefits from continued customary control of land. While the advantages of maintaining the power of the customary institution for a smallholder with privilege may include social, political, and economic rewards, land tenure security provides a meaningful example of how customary privilege can increase or decrease the smallholder's desire to seek state property rights.

Within customary land tenure systems, land is allocated and conflicts adjudicated based on institutional rules, as executed by a CA. The individual smallholder is subject to the CA's interpretation of whose land rights are more legitimate. As a result, the individual's protection under the customary regime is shaped by his or her status within it. All things being equal, one with low customary privilege can expect to lose when faced with someone with higher privilege in a conflict over land. For example, if two smallholders are both seeking access to a prime parcel of land to expand their production, it should be the individual with higher status in the norms of the customary institution who will gain access. Similarly, when the CA must decide who in the village will be displaced to for a new project, the households with lower status can feel less secure in their continued access to land. Individuals with high status derived from the customary institution should have greater confidence in their security of property rights than those with low status, creating a distinction between who seeks titles and who resists them.

A range of attributes can affect the individual's status within the customary institution. In many customary land tenure systems, descent from the individuals who first cleared the land is one characteristic used to legitimize land rights (Ensminger 1997). In Senegal, this is known as the right of the axe or the right of fire.<sup>12</sup> Identification with an ethnic group native to the area is another basis for insider status within the customary institution. This distinction is often represented by the politicized terms stranger/native in Anglophone countries and *allochtone/autochtone* in Francophone countries (henceforth “non-local”/ “local”). The lower status of non-locals in customary institutions has been observed across a range of African countries (see, e.g., Jacob and Le Meur 2010; Lentz 2013). In effect, this means that migrants and their descendants often have lower tenure security than locals (Brasselle, Gaspard, and Platteau 2002). Scholars have also focused on gender in determining privilege within customary institutions; women's land rights are often treated as secondary (Hilhorst 2000; Meinzen-Dick and Mwangi 2009). In some customary institutions, youth are outsiders relative to their elders (Atwood 1990). The norms of customary land ownership differ between communities and over time (Chanock 1998; Pottier 2005); however, the role of CAs as the arbiters of the different institutional rules is a defining feature of customary land in Africa (Chauveau 1998).

This theory of customary privilege applied to the cases of Zambia and Senegal establishes the expectation that individuals with lower levels of privilege should be more likely to exit the customary institution in favor of the state's titles. Households with higher privilege should be more likely to maintain customary property rights. To support the argument that this relationship between titling and privilege is based on a *decision not to exit*, I also examine a testable implication of this theory—that individuals with higher privilege should have greater

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<sup>12</sup> Interview RC-124; For further discussion of the rights of fire (*les droits du feu*) in Senegal, see Galvan (2004, 107).

tenure security in the customary system. For such customary insiders, the customary control of land is a source of social status and economic benefits, reducing the appeal of titling.

## 5 Data and Measurement

I test for the effect of customary privilege on smallholder titling using complementary surveys of smallholder farmers in Zambia and Senegal. The Zambia dataset allows for national breadth, including a nationally representative set of customary institutions. A new Senegal dataset designed to replicate key questions of interest from the Zambia survey concentrates on smallholder titling decisions in just two agricultural zones. Combined, the datasets provide leverage on how the proposed theory of titling functions in contexts with single or multiple customary institutions, and with distinct state institutions. This section describes the two geocoded farmer surveys and sample selection issues.

The Zambia sample is derived from the national Rural Agricultural Livelihoods Survey (RALS) of smallholder farmers implemented in 2012 by the Indaba Agricultural Policy Research Initiative (IAPRI) in collaboration with the Zambian Central Statistics Office (CSO) and Michigan State University (CSO/MoL/IAPRI 2012). The survey is designed to be representative of agricultural households using under 20 ha of land at the provincial level.<sup>13</sup> The study sample of 8403 smallholder farmers excludes households who live in areas of State Land and are not subject to a customary authority. The national survey sample identifies relationships that maintain across a wide variety of agricultural zones and customary institution.

The Senegal smallholder survey is an original survey that replicates many of the questions of interest in the Zambian RALS questionnaire and includes additional questions about land tenure security. The Senegal survey also features open-ended responses that provide more detailed information on the smallholder's individual experience of accessing land. The sample for this study of 961 farmers represents two diverse ecological zones: one in the North and one in the Central region. In addition to the ecological differences between Podor, in the northern Saint-Louis region, and Mbacké, in the central Diourbel region, these districts were selected with attention to representing the two dominant types of marabout customary institutions. In Podor, marabouts are predominantly from the Tidjane brotherhood while Mbacké is the heartland of the Mouride brotherhood. The inclusion of two distinct institutional and ecological zones in Senegal helps ensure that the findings are not unique to one customary institution type in Senegal.

Within the two Senegal sample districts, we randomly sampled smallholder households using a random walk strategy within villages or village pairs,<sup>14</sup> stratified by Rural Council Area. The survey also includes the GPS coordinates of the respondents and village chiefs to calculate spatial attributes for each household. The resulting study sample omits households who reported owning over 50 ha of land. The median land size in both the Senegal and Zambia samples is between 2 and 3 ha of land.

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<sup>13</sup> Eastern Province alone was designed to be representative at the District level. This oversampling in Eastern Province is accounted for by weighting the regression analyses; within this intended sample, some households reported owning over 20ha of land. For both Senegal and Zambia data, 50ha is the cut off for the study sample and all models include a measure of land size.

<sup>14</sup> Villages with less than 50 households were paired with a neighboring village in the sample selection or excluded. This was done to help address the bias towards large villages in the sample.

While survey data are the empirical foundations of this manuscript, qualitative interviews cited earlier provide supplemental support. In Senegal, this is 37 interviews of customary authorities and Rural Council members in the two districts. This includes a minimum of two interviews with CAs and one with the Rural Council president in each of 10 Rural Council areas sampled. In Zambia, 3 CA interviews and one focus group of smallholder farmers were collected in each of a sample of 15 chiefdoms in the Northern Province and Lusaka Province.

## **5.1 Measuring Privilege: Kinship**

To test the argument that privilege within the customary institution makes individuals less likely to title their land, I use an immutable measure of insider status: kinship. Here, insider status is operationalized as social proximity to the institution's leader, derived from ties of parentage. This measure of social proximity to the arbiter of customary rules captures the concept of customary privilege, yet is independent of the content of those rules, which may vary across customary institutions. Further, while the household selects out of other group characteristics that may affect privilege, such as migration, there is no exit option for kinship. Kinship status is independent of different customary norms and free of the potential biases created by mutable individual characteristics. Across a wide range of different customary systems, the blood relatives of the authorities who interpret, protect, or create the customary property rights institutions for the community should have greater privilege than non-relatives.

This measure is constructed from responses to a question featured in both surveys of whether a member of the household is related to the CA. For the Zambia smallholders, the kinship measure is a dummy variable of whether a member of the household is related to either the chief or the headman. In Senegal, the CAs of interest are the village marabout and the village chief. As two distinct types of customary authority that may coexist within the same village, the effect of privilege in relation to each is considered separately. However, it is important to note that the measures of kinship with a chief or a marabout are correlated, indicating shared lineages between marabouts and chiefs.

## **5.2 Land Outcomes**

### *Land Titling*

The primary outcome of interest is whether the household has state or customary property rights. In Zambia, this measures whether the household has a title to any of the plots it uses. In Senegal, the land titling measure includes anyone with a plot that has state property rights—including titles, leases, and Rural Council registration papers, the first step to titling. The two samples have similar rates of titling, 7.51% in Zambia and 7.08% in Senegal. This suggests that, despite the differences between a formal and informal role of CAs in the land titling process, Zambian farmers are not getting titles at lower rates than smallholders in Senegal.

### *Land Tenure Security*

To test the implication of the proposed theory that those with privilege are more committed to the maintenance of customary authority because they benefit from it, I rely on measures of land fallowing. The ability to fallow is indicative of more secure property rights; the household must expect that they can maintain claim over an area of land without continuously using it. By

contrast, insecure farmers feel they cannot leave their land to fallow for fear that it will be expropriated (see, e.g. Gray and Kevane 2001). Operationalizing tenure security as the ability to fallow land is consistent with Goldstein and Udry (2008). In the Senegal sample this is operationalized as whether the household reports that they can leave their land to fallow, with 53% who believe they can. For the Zambia sample, the measure is whether they have any land under fallow, with 30% reporting that they do.

The Senegal survey also asked respondents to rank their tenure security. About a third (37%) reported that it was probable to completely probable that their land would be expropriated. Yet in separate binary question, 68% reported complete security usage rights to the land they use. The majority indicated that the state is most likely to expropriate their land (73%), followed by customary authorities (20%).

### **5.3 Control Variables**

A variety of measures of land values and individual wealth are included as control variables and tests of the “induced institutional change” approach to titling. As customary land in both countries can have no market value until it is titled, monetary measures of different land values are not available. Instead, land value is measured through access to markets and critical infrastructure. In Zambia, distance to markets, roads, and rails are each considered separately in the models. Distance to schools, improved water sources, electricity, and health clinics form an infrastructure index. In Senegal, where the data are more concentrated geographically, roads, rails and markets are included within an infrastructure distance index due to high measures of similarity. The Zambia models also include a measure of population density in the district where the household is located (CSO 2012). The sample areas in Senegal are prohibitively small for a population density measure to be meaningfully applied.

Household-level wealth variables in models for both countries are employment outside of family farming, the household’s highest level of formal education, and the size of landholdings. The Zambia models measure household income through crop sales, remissions, and outside income. The Senegal models include a wealth index of household building materials, cattle ownership, staple crop yields, and reported additional cash income. Social control variables, which additionally function as tests of other characteristics that can affect privilege in the customary institution and titling outcomes, are the gender and age of the household head, whether the household is ethnically local or non-local, and if the household migrated to the community within the last 10 years. Descriptive statistics and measurement details are included in the appendix.

## **6 Results**

If smallholder land titling is a decision shaped by the individual’s status within the customary institution, we should see a difference in land titling between households with high and low privilege. Put succinctly, those with low privilege should select the state’s property rights, while those with high privilege should choose the chief’s. This section provides evidence that the kin of the CA are less likely to title their land, and that customary kin resist land titling because their customary property rights are more secure.

## 6.1 Who Titles?

Across a range of customary institution-types in Zambia and Senegal, individuals with privilege, the blood relatives of customary authorities, are less likely to have state land titles. Table 1 reports three models of the impact of kinship on titling in Zambia. These estimates of the binary outcome of land titling are logistic regression models with clustered standard errors. Model 2 demonstrates that the kin of customary authorities are less likely to have land titles when taking into account a full set of land values indicators and measures of individual wealth. These controls are important as it is plausible, for example, that customary kin are more likely to maintain customary property rights because they do not have access to cash income from off-farm employment to pay the fees of titling or that, as insiders, they would have systematically larger land holdings. However, this analysis indicates that these measures of wealth and education are not driving the relationship between customary kin and the lack of state property rights. Similarly, the decreased likelihood of customary kin to title their land is independent of the value of land. Model 1 reports a restricted model, omitting land values controls. The omission of the land values indicators increases the number of observations, which result from the missing household data on market access. The missing observations do not bias the findings; the relationship between kinship and titling maintains on both the reduced sample and full set of observations.

**Table 1: Effect of Kinship on Smallholder Titling, Zambia**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
KINSHIP	-.729*** (.180)	-.571** (.199)	-.540** (.200)
POPULATION DENSITY	—	.164** (.057)	.162** (.059)
DISTANCE TO THE CAPITAL	—	-.027 (.056)	-.027 (.056)
DISTANCE TO MARKETS	—	-.011* (.005)	-.011* (.005)
DISTANT TO INFRASTRUCTURE	—	-.017 (.014)	-.017 (.014)
RAILROADS	—	-.002 (.001)	-.002 (.001)
ROADS	—	-.048* (.033)	-.048 (.032)
EDUCATION	.506*** (.102)	.451*** (.105)	.443*** (.107)
EMPLOYMENT	.622*** (.192)	.537** (.186)	.502** (.187)
SIZE OF LAND OWNED	.041*** (.012)	.048*** (.012)	.050*** (.011)
INCOME	.103 (.077)	.094 (.080)	.098 (.089)
ARRIVAL WITHIN 10 YEARS	—	—	.279** (.093)
LOCAL	—	—	.119 (.238)
YOUTH HEADED HOUSEHOLD	—	—	.019 (.110)
FEMALE HEADED HOUSEHOLD	—	—	.091 (.154)
CONSTANT	-3.824*** (.300)	-2.891*** (.433)	-3.114*** (.484)
N	8403	7833	7827
PSEUDO R <sup>2</sup>	.0645	.0905	.0925

Notes: +p < 0.1, \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

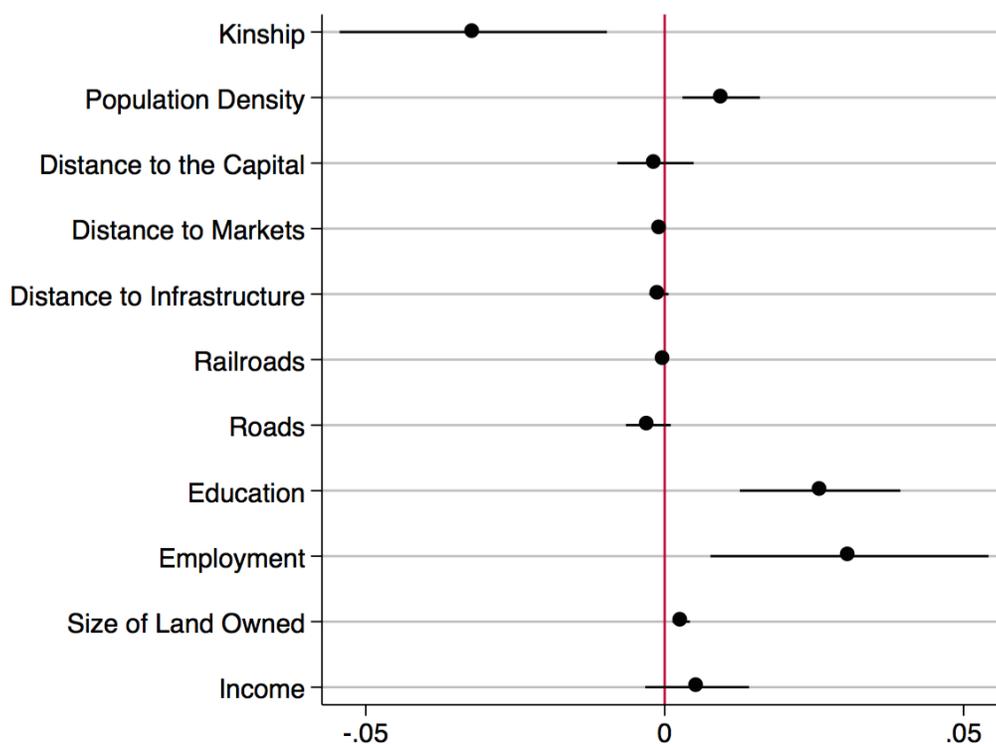
Logistic regression coefficients with robust standard errors clustered at the district level presented in parentheses. Outcome is title.

Model 3 builds upon the basic model of land values and kinship with social control variables, which may also represent other indicators of privilege. Here, the effects of migrant, local, youth-headed, and female-headed households are added to the kinship model. Households who migrated to the community within the past 10 years are more likely to title, however membership in youth and female-headed households has no significant impact on the likelihood of titling. While these attributes are important to test given their prominence in scholarship on land tenure in Africa (Atwood 1990), the lack of predictive power on land titling across all customary institutions in Zambia is evidence that while they may have important impacts on privilege and land access in some communities, their impact on land titling outcomes is not systematic.

Importantly, this model provides evidence that the strong effect of kinship on titling outcomes is independent of ethnicity (“Local”) and migration status. This relationship is also robust to the inclusion of alternative tests of this logic, including whether a member of the household’s family was born there and whether the household reported purchasing or inheriting land. The trend of customary privilege conditioning the likelihood of titling is not the result of outsiders moving into the community to purchase titled land.

Figure 1 presents the average marginal effects of each variable on the probability of titling. A closer examination of the predicted probabilities provides a clearer picture of the importance of customary privilege on titling. If land titles were equally desirable to all residents independent of their status within the customary institution, the ability to pay should be the primary constraint to land titling. However, the predicted probability of a non-relative farmer in the *lowest* income category having title is on par with that of the *wealthiest* relative of a CA (probabilities of .063 and .057, respectively). The effect of privilege on titling outcomes is important in magnitude and consistent across conventional predictors of titling.

**Figure 1: Average Marginal Effects on the Likelihood of Titles in Zambia**



Notes: Figure presents the average predicted probability of change for each variable on the likelihood to titling, with 95% confidence intervals.

Testing this hypothesis in a different country with contrasting legal roles for customary authority and different forms of customary institutions speaks to the generalizability of the theory. This phenomenon is not the result of something unique to Zambia but is indicative of a

broader pattern; smallholder farmers strategically select to title or not based on their status within the customary institution. Those with greater privilege invest in the continuation of customary control over land by not seeking title. Those without privilege are quicker to exit. Analysis of smallholder titling in Senegal confirms that those with privileged status in the customary institution are less likely to seek land titles.

Village chiefs in Senegal are the guardians of customary property rights. They adjudicate land conflicts and interpret customary rules, often with reference to lineage-based land ownership. The village chief's kin gain privileged status from this relationship and are less likely to have state property rights than farmers without such close ties to the local CA. Table 3 reports the findings of logistic regression models predicting the probability of title, with clustered standard errors. Model 1, Table 2 reports this relationship between kinship with the village chief and the likelihood of having title. Independent of income, land size, employment, infrastructure access, and formal education, there is a significant and negative effect of kinship with the CA on state land titling. Model 2 adds the social controls to the model of the effect of kinship on titling in Senegal. This includes whether the household migrated within the last 10 years, whether they are considered ethnically local and if the household head is female or a youth. As in Zambia, the effect of kinship is independent of a local ethnicity and the relationship is robust to measures of accessing land through purchase or inheritance. These models indicate that, given two households with the same level of education and income, it is the farmer who is not related to the chief is nearly twice as likely to have title. Similarly, while we should expect individuals to title better land (Besley 1995), on plots of equally high value land, the kin of the CA will be slower to title than their non-kin neighbors.

**Table 2: The Effect of Kinship with a Customary Authority on Land Titling in Senegal**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
KINSHIP WITH CHIEF	-.393** (.037)	-.406** (.022)	—	—
KINSHIP WITH MARABOUT		—	-.242* (.115)	-.254* (.125)
DISTANCE TO INFRASTRUCTURE	-.812* (.372)	-.817* (.348)	-.877* (.433)	-.873* (.403)
EDUCATION	.012 (.018)	.021 (.019)	-.002 (.006)	.002 (.009)
EMPLOYMENT	-.082 (.155)	-.078 (.181)	-.003 (.132)	.002 (.166)
WEALTH	.124 (.273)	.131 (.270)	.106 (.281)	.117 (.280)
SIZE OF LAND OWNED	-.040+ (.022)	-.040+ (.023)	-.034 (.025)	-.035 (.026)
LOCAL	—	.138 (.224)	—	.083 (.320)
ARRIVAL WITHIN 10 YEARS	—	.076 (.172)	—	.122 (.206)
YOUTH HEADED HOUSEHOLD	—	.117+ (.070)	—	.069 (.130)
FEMALE HEADED HOUSEHOLD	—	.164 (.388)	—	.149 (.368)
CONSTANT	-2.530** (.129)	-2.716** (.001)	-2.705** (.110)	-2.829** (.093)
N	918	908	874	864
PSEUDO R <sup>2</sup>	.1037	.1062	.1000	.1015

Notes: +p < 0.1, \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

Logistic regression coefficients with robust standard errors clustered at the district level presented in parentheses.

Outcome is title.

In models 3 and 4, I operationalize customary privilege as kinship with the village marabout. This test of the hypothesis reduces the sample size, as some villages do not have marabouts. The relationship between kinship with a marabout and land titling is negative, significant, and robust to a range of model specifications. This indicates that customary privilege also predicts not-titling in settings with multiple customary authorities and multiple sources of legitimacy for the customary institution.

**Figure 2: Average Marginal Effects on Likelihood of Titling in Senegal**

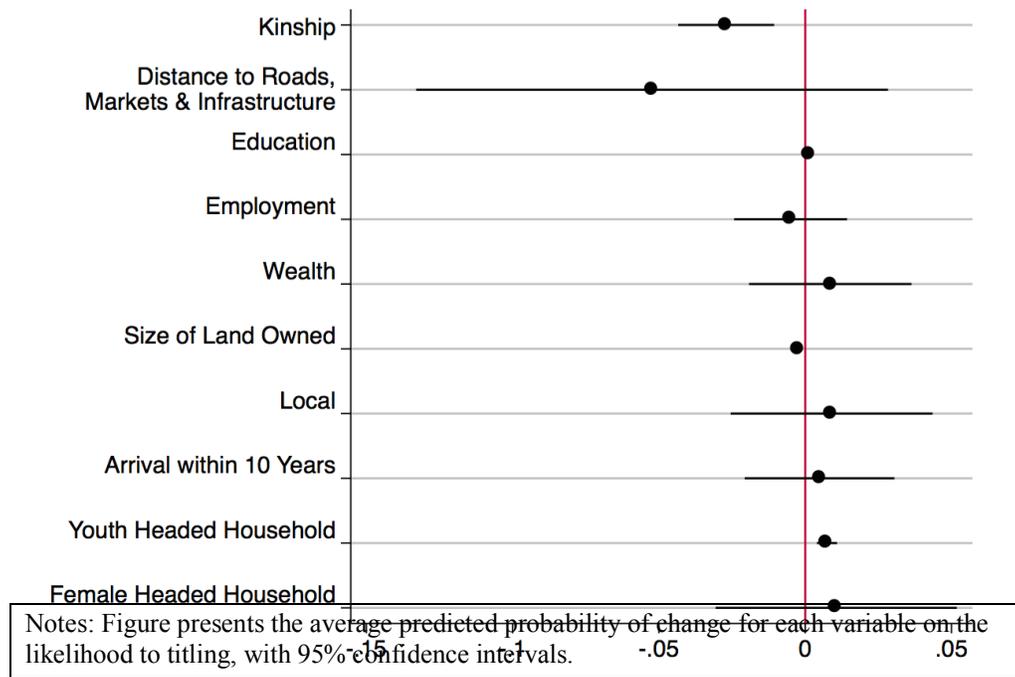


Figure 2 reports the marginal effects of these variables on the likelihood of titling in Senegal. As in Zambia, the magnitude of the effect of a shift from kin to non-kin is similar to moving from the poorest to the wealthiest income category. In both samples, the effect of kinship is also more consistently predictive. Within the lowest income households, the probability of titling increases from 4.9% for kin to 7.1% for non-kin. Among the wealthiest households, with the greatest access to the resources need to obtain titles, customary kin have the same likelihood of titling as the poorest non-kin, 7.0%. However, for the wealthiest households that lack customary privilege, the predicted probability of title is 10.1%.

In both Zambia and Senegal, households with privileged status within the customary institution are more likely to maintain customary property rights. This is evidence of the importance of status within the customary institution on the individual’s decision to seek title. In the next section, I explore the mechanisms that drive the consistent relationship between customary privilege and land titling outcomes.

## 6.2 Why Does Customary Privilege Decrease Titling?

Both survey instruments include a question on the household’s perception of the availability of land titles. In Zambia, the two different outcome variables—titles and reported ability to title—only have a minor correlation ( $r=.1063$ ), but they provide a remarkably similar picture of how privileged status affects land titling. Customary kin are significantly more likely to report that land titling is *not possible in their village* (Appendix, Table 6). Among the subset of respondents who have customary property rights, there is a negative and significant relationship between kinship and reported accessibility of titles in Zambia.

In Senegal, the ability to title question includes an open-ended follow-up question that sheds insight into why the households that are closest to the customary authority may report that the conversion of land from customary to state property rights is impossible. Respondents who reported that titles were not accessible were prompted to explain why. As expected, barriers such as lack of resources and limited information were often cited as reasons why titles are not accessible. However 25% of the 257 individuals who said they could not access titles reported that the limitation was not material, but that state land registration and titling is unwanted or inappropriate in their village. If those with privilege are actively selecting not to title, we should see that kinship predicts such resistant attitudes towards title.

I test this implication of theory on the subset of respondents with customary property rights who reported that it is not possible to title. Responses such as “that’s not our practice in this community” or “we don’t need those, the land belongs to me” are coded as a category of resistance to land titling. Table 3 reports these results. Individuals with kinship ties to a customary authority are more likely to have a resistant attitude towards state land titles. While kinship with a CA does not predict whether the respondent reported that titling is possible or not (Appendix, Table 7), it does predict whether they report that titles are not accessible *because they are unwanted*. The effect of education is also noteworthy in these models. Recalling that this is a subsample of respondents who reported that title was not accessible to them, those with a high level of information and familiarity with state documents who report that they cannot title their land are more likely justify this with resistance, rather than ignorance of the process. This is further evidence that smallholder farmers make an active choice in deciding to title or remain under customary property rights.

**Table 3: Determinants of Resistance to Titling in Senegal**

	Model 1	Model 2	Model 3	Model 4
KINSHIP WITH CHIEF	.693* (.330)	.613* (.263)	—	—
KINSHIP WITH MARABOUT	—	—	.997* (.413)	.944* (.389)
INFRASTRUCTURE DISTANCE	-.038 (.352)	.240 (.244)	-.056 (.381)	.173 (.302)
EDUCATION	.443** (.143)	.438* (.181)	.419** (.147)	.402* (.186)
EMPLOYMENT	-1.304+ (.775)	-1.398 (.181)	-1.337** (.542)	-1.390* (.603)
WEALTH	.024 (.078)	.068 (.080)	.023 (.062)	.059 (.045)
SIZE OF LAND OWNED	-.136 (.167)	-.116 (.156)	-.164 (.166)	-.148 (.165)
ARRIVAL WITHIN 10 YEARS	—	.239 (.722)	—	.029 (.574)
LOCAL	—	2.135** (.293)	—	1.763** (.219)
YOUTH HEADED HOUSEHOLD	—	-.346 (.796)	—	-.538 (.704)
FEMALE HEADED HOUSEHOLD	—	.000 (.280)	—	.114 (.159)
CONSTANT	-.985 (1.132)	-2.750** (.928)	-1.042 (1.042)	-2.444** (.924)
N	237	234	224	221
PSEUDO R <sup>2</sup>	.1407	.1868	.1674	.2046

Notes: +p < 0.1, \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

Logistic regression coefficients with robust standard errors clustered at the district level presented in parentheses. Outcome is resistance to titling. The respondents are the sub-sample of those who reported that title was not accessible to them and do not have titles.

### 6.3 Does Privilege Increase Tenure Security?

The theory proposed here argues that individuals with greater customary privilege maintain their customary property rights because their status is tied to the continued influence of customary authority, including customary control over land. One key benefit of the continued power of the customary authority for customary insiders is better outcomes in land disputes; that is, that privilege should increase the household's land tenure security within the system of customary property rights. Among households that rely on customary property rights, those with privilege should be more likely to engage in activities that require high tenure security.

Tables 4 and 5 report the effects of kinship on whether the household has any land under fallow in Zambia and Senegal. To support the theory proposed here, kinship should predict fallowing for the subsample of households with customary property rights. Table 4 provides evidence that the kin of customary authorities in Zambia are significantly more likely to fallow land, independent of the full set of economic (Model 1) and social (Model 3) control variables. Models 2 and 4 present the same analyses of the full sample for reference; these include

individuals who have title may feel tenure security for reasons independent of the customary privilege theory.

It is powerful confirmation of the theory that this relationship between kinship and fallowing is consistent in Senegal as well. Models 1 and 3 (Table 5) report the positive relationship between kinship and fallowing. Of smallholder farmers who access their land through customary property rights, those with kinship ties to the CA are more likely to fallow. Individuals with low privilege in the customary institution are less likely to fallow, indicative of weaker tenure security. They cannot leave land unplanted without fear that it will be allocated to someone else. Customary property rights are more credible for the kin of customary authorities; non-kin indicate through their fallowing behavior that they have lower confidence in their rights to continued access to land within their given customary institution. This helps establish why households without customary privilege are more likely to exit the customary institution in favor of state titles.

**Table 4: The Effect of Kinship on Tenure Security, Zambia**

	<b>Model 1: Customary PR only</b>	<b>Model 2: Full Sample</b>	<b>Model 3: Customary PR only</b>	<b>Model 4: Full Sample</b>
KINSHIP	.279** (.105)	.307** (.105)	.226* (.103)	.246* (.103)
POPULATION DENSITY	-.909* (.362)	-.794** (.337)	-.933* (.371)	-.810* (.343)
DISTANCE TO THE CAPITAL	.029 (.039)	.020 (.037)	.026 (.038)	.017 (.037)
DISTANCE TO MARKETS	.003 (.002)	.004 (.002)	.003 (.002)	.004 (.002)
INFRASTRUCTURE DISTANCE	-.020** (.007)	-.019** (.005)	-.019** (.007)	-.018* (.008)
RAILROADS	.002** (.001)	.002** (.001)	.002** (.001)	.002** (.001)
ROADS	-.025 (.016)	-.027+ (.016)	-.023 (.001)	-.025 (.016)
EDUCATION	.005 (.062)	.002 (.063)	-.006 (.062)	.001 (.062)
EMPLOYMENT	.188* (.120)	.165 (.118)	.249* (.117)	.231* (.116)
SIZE OF LAND OWNED	.222*** (.028)	.207*** (.027)	.212*** (.028)	.197*** (.026)
INCOME	-.100* (.039)	-.089* (.038)	-.107** (.040)	-.097* (.039)
ARRIVAL WITHIN 10 YEARS	—	—	-.323** (.098)	-.344*** (.092)
LOCAL	—	—	.209 (.142)	.246+ (.144)
YOUTH HEADED HOUSEHOLD	—	—	-.156+ (.083)	-.132+ (.076)
FEMALE HEADED HOUSEHOLD	—	—	-.199* (.100)	-.209* (.076)
CONSTANT	-1.480** (.226)	-1.484*** (.230)	-1.376*** (.247)	-1.426*** (.226)
N	7221	7833	7216	7827
PSEUDO R <sup>2</sup>	.0845	.0827	.0899	.0886

Notes: +p < 0.1, \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

Logistic regression coefficients with robust standard errors clustered at the district level presented in parentheses.

Outcome is following.

**Table 5: The Effect of Kinship on Tenure Security, Senegal**

	<b>Model 1: Customary PR only</b>	<b>Model 2: Full Sample</b>	<b>Model 3: Customary PR only</b>	<b>Model 4: Full Sample</b>
KINSHIP WITH CHIEF	.187** (.035)	.118+ (.063)	—	—
KINSHIP WITH MARABOUT	—	—	.624** (.014)	.545** (.097)
INFRASTRUCTURE DISTANCE	.029 (.019)	.017** (.004)	.042 (.039)	.023* (.009)
EDUCATION	-.030 (.111)	-.024 (.107)	-.046 (.124)	-.041 (.116)
EMPLOYMENT	.341* (.168)	.333* (.132)	.391** (.141)	.388** (.096)
WEALTH INDEX	.014 (.032)	.018 (.052)	-.103 (.025)	-.005 (.047)
SIZE OF LAND OWNED	.026** (.002)	.026** (.001)	.019** (.001)	.019** (.001)
LOCAL	-.029 (.229)	-.030 (.219)	-.152 (.238)	-.156 (.209)
ARRIVAL WITHIN 10 YEARS	.260* (.106)	.296 (.052)	.148+ (.083)	.217** (.001)
YOUTH HEADED HOUSEHOLD	.226** (.088)	.228** (.056)	.257** (.017)	.238** (.032)
FEMALE HEADED HOUSEHOLD	-.378 (.675)	.363 (.608)	-.358 (.639)	-.361 (.570)
CONSTANT	-.293** (.099)	-.209 (.145)	-.443** (.059)	-.342** (.131)
OBSERVATIONS	808	873	769	833
PSEUDO R <sup>2</sup>	.0204	.0184	.0335	.0286

Notes: +p < 0.1, \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

Logistic regression coefficients with robust standard errors clustered at the district level presented in parentheses. Outcome is fallowing.

These results indicate a consistent relationship between privilege within the customary institution and land titling outcomes. In Zambia and Senegal, individuals with kinship ties to customary authorities are less likely to title. Further, not titling is, in part, an active decision by smallholder farmers. Evidence from Senegal indicates that customary kin report that titling is not possible because it is unwanted there. Finally, those with privilege are not only less likely to title their land, but they are more likely to fallow their land. Their customary property rights are stronger than those without privilege within the customary institution, contributing to the decision not to seek title.

## 7 Discussion

The theory and results presented here demonstrate that customary institutions structure how land titling develops. Individuals choose to exit the customary institution in favor of titling when they

have lower customary status. Those who have high status enjoy greater benefits for retaining customary property rights and are more likely to resist titling. This is evidence that for some smallholder farmers the informal customary property rights system is working, but for other community members titling is preferable. The original theory and mechanism proposed here are supported by findings from two distinct national contexts within Africa. In both the *de facto* and *de jure* systems of customary authority represented by Senegal and Zambia, and across customary institutions with distinct sources of legitimacy in Senegal, there is a consistent inverse relationship between the household's status in relation to the adjudicator of customary property rights and titling outcomes.

The effect of customary privilege is independent of the conventional drivers of land titling. Yet these results find support for the Boserup hypothesis and the "induced institutional change" approach to land titling (Ruttan and Hayami 1984; Deininger and Feder 2001). Individuals title more valuable land (Besley 1995), as measured by proximity to critical infrastructure and higher population densities. Further, wealthier individuals are more likely to title. Education, employment, and land size increase titling. While income measures do not consistently predict titling here, particularly when infrastructure is included in the model, its effect is in the expected direction. However, these findings indicate that modeling the titling decision based on land markets and land values is insufficient. On land of equal value, a farmer with lower status in the customary institution is more likely to title than a neighbor with higher customary status. In the context of increasing land values creating more competition for land, the customary institution will continue to structure who seeks state property rights. This adds an intrinsically political explanation for land titling and the development of statutory property rights beyond the conventional geographic, demographic, and economic explanations. Customary institutions and the privilege they create must be added to our models of land titling as variables that have a systematic impact on impacts whether farmers chose to title.

Further, these results suggest that the persistence of customary authority over land is not merely a consequence of limited resources for formalizing property rights but forces that actively *maintain* customary rights over land. For some populations, customary authority is efficient and beneficial. The increased likelihood of following for high customary status households in both Senegal and Zambia is evidence of this. This is indicative of important variation in how well-protected people feel by customary authorities. The variation in how well customary authority functions for individuals prompts them to make decisions that support or undermine the power of the customary institution. These results suggest, more generally, that customary authorities continue to be influential because they broker relationships and access within the community; it is the populations who benefit that invest in sustaining customary authority.

This also has implications for the individual's relationship with the state. While scholars have focused on the ties between powerful customary elites and the state (Bayart 1989; Williams 2010), these results indicate that it is the most vulnerable within the customary institution who seek the protections of the state. All things being equal, smallholders with greater status within their customary institutions are more content to remain independent of the state's system of property rights. This is true of both customary authority that is recognized by the state (in Zambia) and lacking recognition (in Senegal). This analysis of land titling shows that customary institutions condition which citizens engage with the state.

## 8 Conclusions

These findings demonstrate that customary land tenure works better for some smallholders than others, even within the same communities and ecological zones. In doing so, this manuscript responds to the call to improve upon the dominant discourses of adaptability and openness in customary land tenure systems by addressing the importance of social divisions (Peters 2004). The theory and empirics presented here indicate that in the context of negotiable customary property rights regimes, customary authorities allocate different levels of privilege which have consequences for smallholders' tenure security and interest in land titling. This adds complexity to a romantic view of adaptable customary land tenure, reminding us that, like other political institutions, customary institutions create winners and losers.

This speaks to the importance of shifting the debate over land titling from whether it is efficient or not, to *for whom* it is more or less efficient (Monkkonen 2016). While some smallholders have a strong desire to convert their customary claims into statutory property rights, for others titling is unwanted or unnecessary. Those who have the lowest privilege within customary institutions are the population that is most in need of the protections of state property rights. These findings predict when two individuals are faced with expropriation from their land, smallholders with lower customary status are systematically more likely to lose out. As demand for large areas of customary land for commercial farming projects grows, we can expect that households without the protections of high privilege within a customary institution should be disproportionately affected. Thus land registration and land titling must be more easily accessible; being deeply embedded in a customary institution cannot be the only option for securing a smallholder's property rights.

Finally, this manuscript has argued that land titling is a political process that shifts who controls an increasingly valuable natural resource. For policy makers designing external land titling interventions, these results make the critical point that titling will change power relations and social structures within a given community. Smallholders respond to their positions within customary institutions by titling, which, in turn, has consequences for the continuing influence of those customary authorities. Thus any interventions seeking to transform how property rights are protected must consider the different political costs to segments of the smallholder population and how to preserve the positive aspects of existing social structures.

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## Appendix

**Table 6: Smallholders Reporting That It Is Possible to Title Land in their Community, Zambia**

	Model 1	Model 2
KINSHIP	-.306** (.087)	-.306** (.091)
POPULATION DENSITY	.046 (.093)	.050 (.088)
DISTANCE TO THE CAPITAL	-.064 (.053)	-.067 (.053)
DISTANCE TO MARKETS	-.006+ (.003)	-.006+ (.003)
INFRASTRUCTURE DISTANCE	.015+ (.008)	.015+ (.008)
RAILROADS	.002* (.001)	.002* (.001)
ROADS	-.035* (.014)	-.035* (.014)
EDUCATION	.026 (.046)	.040 (.046)
EMPLOYMENT	.023 (.102)	.004 (.102)
SIZE OF LAND OWNED	.004 (.013)	.004 (.013)
INCOME	.146*** (.036)	.140*** (.037)
ARRIVAL WITHIN 10 YEARS	—	.199** (.072)
LOCAL	—	.217+ (.123)
YOUTH HEADED HOUSEHOLD	—	.047 (.073)
FEMALE HEADED HOUSEHOLD	—	-.081 (.089)
CONSTANT	-.950* (.383)	-1.192** (.388)
N	7217	7212
PSEUDO R <sup>2</sup>	.0240	.0261

Notes: +p < 0.1, \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

Logistic regression coefficients with robust standard errors clustered at the district level presented in parentheses. Outcome is response to “It is possible to change the tenure status of the land in this village, (i.e. to convert customary land into titled property?)” Sub-sample of those who do not already have titles.

**Table 7: Smallholder Reporting That It Is Possible to Title Their Land, Senegal**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
KINSHIP WITH CHIEF	.178 (.292)	.171 (.130)	—	—
KINSHIP WITH MARABOUT	—	—	-.157 (.124)	-.168** (.001)
INFRASTRUCTURE DISTANCE	.001 (.031)	.003 (.003)	.020 (.048)	.024** (.010)
EDUCATION	.130 (.310)	.129 (.310)	.170 (.297)	.157 (.302)
EMPLOYMENT	-.178 (.497)	-.188 (.500)	-.202 (.411)	-.212 (.432)
WEALTH	.025 (.035)	.027 (.037)	.046 (.042)	.051 (.041)
SIZE OF LAND OWNED	.042* (.021)	.038+ (.022)	.037+ (019)	.034+ (.020)
LOCAL	—	.247 (.680)	—	.320 (.731)
ARRIVAL WITHIN 10 YEARS	—	-.349* (.155)	—	-.200** (.004)
YOUTH HEADED HOUSEHOLD	—	.117** (.008)	—	.136** (.022)
FEMALE HEADED HOUSEHOLD	—	-.649* (.287)	—	-.617+ (.346)
CONSTANT	.518 (.509)	.450** (.088)	.723 (.645)	.578** (.151)
N	851	841	808	798
PSEUDO R <sup>2</sup>	.0195	.0333	.0192	.0314

Notes: +p < 0.1, \*p<0.05, \*\*p<0.01, \*\*\*p <0.001.

Logistic regression coefficients with robust standard errors clustered at the district level presented in parentheses. Outcome is response to “It is possible for your household to obtain Rural Council Papers?”. Sub-sample of those who do not already have titles.

**Table 8: Zambia Smallholder Dataset**

Variable	Measurement	Source	Mean	SD	Min	Max
LAND TITLE	Household has a title or not on any field	Indaba Agricultural Policy Research Institute, Central Statistics Office, and Ministry of Agriculture and Livestock (IAPRI/CSO/MAL). 2012. Rural Agricultural Livelihoods Survey (RALS12). Lusaka, Zambia: IAPRI/CSO/MAL.	.08	.26	0	1
ABILITY TO ACCESS TITLE	Household reports that it is “possible to change the tenure status of the land in this village, (i.e. to convert customary land into titled property)”	RALS12	.19	.40	0	1
FALLOW	Household reports any land under fallow (binary).	RALS12	.30	.46	0	1
KINSHIP	Household head or spouse is related to the chief or the headman (binary).	RALS12	.51	.50	0	1
POPULATION DENSITY	2010 Total population of the district over the size of customary land in the district (district size excluding national parks and forest).	Central Statistical Office (CSO). 2012. The 2010 Census of Population and Housing. Lusaka, Zambia: Central Statistical Office.	.45	2.11	.04	40.56
DISTANCE TO THE CAPITAL	Distance in 100KM from household to Lusaka.	Author’s calculations based on household GPS location and Zambia Wildlife Authority (ZAWA) shapefiles. 2014.	4.40	2.10	.24	8.33
DISTANCE TO MARKETS	Index of reported township (“boma”) distance and reported market distance	RALS12	33.80	29.08	0	330
DISTANCE TO INFRASTRUCTURE	Index of reported distances to basic school, health clinic, electricity, improved water source	RALS12	8.94	9.94	0	145
RAILROAD	Distance in KM from household to a railway	Author’s calculations based on household GPS location and ZAWA shapefiles.	139.41	105.04	.00	492.40

ROADS	Distance in KM from household to a road of any surface	Author's calculations based on household GPS location and ZAWA shapefiles.	3.61	4.62	.00	53.48
EDUCATION	Highest formal education level achieved; categorized as primary, secondary, tertiary	RALS12	1.60	.68	0	3
EMPLOYMENT	Household member has employment outside of family agriculture (binary)	RALS12	.19	.40	0	1
SIZE OF LAND OWNED	Total land owned by the household in hectares, as reported by Respondent	RALS12	3.61 (Median: 2.31)	4.37	0	50.00
INCOME	Quintiles of net household income from agricultural and livestock production and sales and off-farm income	RALS12	3.00	1.41	1	5
YOUTH HEADED HOUSEHOLD	Household head is 40 years or under (binary)	RALS12	.45	.50	0	1
FEMALE HEADED HOUSEHOLD	Household head is female (binary)	RALS12	.19	.40	0	1
NEWCOMER	Household arrived within the past 10 years (binary)	RALS12	.27	.44	0	1
LOCAL	Household is considered local (binary)	RALS12	.89	.32	0	1

**Table 9: Senegal Smallholder Dataset**

<b>Variable</b>	<b>Measurement</b>	<b>Source</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
LAND TITLE	Household reported having a form of statutory property rights (title, lease, or Rural Council <i>extract de deliberations</i> )	Author, Senegal Smallholder Survey (2014)	.07	.25	0	1
ABILITY TO ACCESS TITLE	Respondent reported that it is possible for their household to obtain an <i>extract</i> for their land (binary)	Ibid.	.73	.45	0	1
LAND TENURE SECURITY	Respondent reported complete security to continuing using the land they cultivate (binary)	Ibid.	.68	.47	0	1
KINSHIP WITH VILLAGE CHIEF	Respondent reported that a member of the household is related to the village chief (binary)	Ibid.	.65	.48	0	1
KINSHIP WITH MARABOUT	Respondent reported that a member of the household is related to the marabout (binary)	Ibid.	.61	.49	0	1
EDUCATION	Highest level of formal schooling of anyone in the household; categorized as primary, junior high school, high school, post-secondary	Ibid.	1.38	1.25	0	4
EMPLOYMENT	Household member has employment outside of family agriculture (binary)	Ibid.	.60	.49	0	1
WEALTH	PCA of measures of building materials, cash income, staple crop yield 2013, number of cattle	Ibid.	.00	1.29	-1.96	4.14
SIZE OF LAND OWNED	Total land owned by the household in 2013 in hectares, as reported by Respondent	Ibid.	5.54 (Median: 2.31)	7.31	.01	48.15
INFRASTRUCTURE DISTANCE	PCA of distance to Paved Road (calculated using GPS coordinates), distance to dirt road (calculated using GPS coordinates), reported distance to a market, improved water source, electricity, health clinic with nurse	Ibid.	-.02	1.58	-1.65	22.10
YOUTH HEADED HOUSEHOLD	Household head is 40 years or under (binary)	Ibid.	.32	.47	0	1
FEMALE HEADED HOUSEHOLD	Household head is female (binary)	Ibid.	.16	.36	0	1
NEWCOMER	Household arrived within the past 10 years (binary)	Ibid.	.05	.21	0	1
LOCAL	Household is considered local (binary) Response to survey question “Is your household considered non-local ( <i>allochtone</i> ) or local ( <i>autochtone</i> )?”	Ibid.	.87	.34	0	1