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Property Rights and Social Institutions in Urban Africa: Experimental Evidence From a Land Formalization Program in the DRC

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Abstract
Formal property rights to land remain rare in sub-Saharan Africa. We argue that social institutions shape citizens' demand for land formalization. When offered the opportunity to formalize, citizens weigh the insurance and tenure-security benefits of informal institutions against their monetary and social obligations. We study a randomized land titling program in a large Congolese city that sharply reduced the costs of acquiring a title. The program caused large increases in both initiation and receipt of titles.

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Data Availability Statement included at the end of the article

Demand was strongest among citizens more engaged in social institutions and more connected to city chiefs, yet such ties did not predict completion of the titling process. Program assignment also reduced citizens' participation in social institutions and worsened their evaluations of chiefs. These findings suggest that, in urban settings where land values are higher and social institutions are more costly, citizens may exit social institutions when formal alternatives become available, illustrating how formalization can reshape engagement with informal authority.

Keywords
African politics, political economy, state building, politics of growth/development, experimental research

Introduction

Well-defined property rights are widely considered a cornerstone of economic development and political order (Acemoglu et al., 2001; Albertus & Klaus, 2025; Barzel, 2002; Boone, 2014; De Soto, 2000; Levi & Russell, 2025; North & Thomas, 1973).[1] Insecure property rights make individuals fear expropriation, depressing incentives to invest (Demsetz, 1967; Field, 2005). Motivated by these arguments, governments and international organizations have expanded land titling programs across the developing world.[2] Yet land formalization remains low, and the evidence linking titling to tenure security and productivity is mixed (Fenske, 2011; Huntington & Shenoy, 2021; Jacoby & Minten, 2007; Lawry et al., 2017). This puzzle is particularly pronounced in sub-Saharan Africa, where roughly 90 percent of land is not formally registered.[3]

To explain these low rates of land formalization, some have proposed a demand-side explanation: communal land rights–and, more generally, social institutions–substitute effectively for formal land rights by providing insurance and tenure security (Bromley, 2009; Deininger & Feder, 2001; Lawry et al., 2017; Sjaastad & Bromley, 1997).[4] Under this *insurance* logic, citizens do not demand formal land titles because they can do without them.

In this article, we leverage experimental variation from a large urban randomized land titling program to answer two questions: (1) How does citizens' participation in social institutions affect their demand for formal land titles? and (2) How does land formalization, in turn, affect citizens' participation in those institutions? Policies promoting formalization are invariably implemented against the backdrop of pre-existing social institutions, which may shape the take-up and effects of these policies (Acemoglu & Robinson, 2019; Boone, 2014; Levi & Russell, 2025; Migdal, 1988; O'Donnell, 2006; Wang, 2022). Social institutions provide tenure security and insurance, but they also impose monetary obligations and social dependence. We argue that citizens' demand for formal land titles reflects a trade-off between the insurance and tenure-security benefits of social institutions and the costs they impose. In urban settings, where land values are higher and the costs of social obligations loom larger, the availability of formal titles allows citizens to reduce their reliance on social institutions: citizens' demand for formal titles reflects a desire to *exit* those institutions. Formal land rights can thus function as an institutional bypass–they provide a pathway around existing obligations without directly altering the underlying institutions (Prado & Trebilcock, 2018).

Studying the relationship between social institutions and formal titling poses substantial empirical challenges. Land titling is endogenous to economic development (Alston et al., 1999), social norms (Platteau, 1996), and political incentives (Albertus, 2015, 2021; Boone, 2014, 2018; Hassan & Klaus, 2023). While recent work suggests that communal institutions may substitute for formal land rights (Honig, 2022; Le Rossignol et al., 2024), the empirical record remains mixed. Our research design enables a systematic analysis of land titling and social institutions in an urban setting, allowing us to examine both citizens' demand for titles and the causal effects of formalization on participation in social institutions.

In collaboration with the Provincial Government of Kasaï Central, we designed a randomized land titling program in the city of Kananga, in the Democratic Republic of Congo (DRC), where only 15 percent of citizens have a formal title to their land. The program was implemented by the government's Cadastral and Land Titling Offices. To our knowledge, this is the first successful randomized controlled trial of land titling in an urban setting. Eligible households interested in a land title were randomly assigned to treatment and control groups. The treatment group was offered large reductions in the monetary and transaction costs of acquiring a land title. Whereas citizens routinely pay \$1,000 or more for a title in Kananga, the titling program capped household outlays at the official price of \$100. Government officials and program staff visited participants at their homes, reducing transaction costs by avoiding frequent trips to government offices. The control group had the option to obtain a land title through the status quo process.

The program significantly increased demand for titles. Assignment to the program caused a 44 percentage-point (pp) increase in the probability that households initiated the formalization process and a 13.7 percentage-point increase in the probability of receiving a formal land title. In the control group, very few citizens attempted to obtain a title, and almost none were successful during the two-year study period. The large increase in take-up reflects citizens' high valuation of titles and the substantial costs of accessing the state under the status quo (Fredriksson, 2014; Rizzo, 2025). The gap between initiation and receipt likely reflects a combination of poor coordination across government offices and weak bureaucratic incentives.

Because we observe both take-up and causal effects of land titling, this empirical setting allows us to study which citizens are more likely to demand a formal land title and which are more likely to acquire one. While our analysis of heterogeneous take-up is not strictly causal, it sheds light on how participation in social institutions shapes demand for land titling. Citizens who participate more in *horizontal* social institutions–such as churches and mutual aid societies–display higher demand for land titles but are not more likely to obtain them. We find similar patterns when examining *vertical* institutions. Citizens with closer connections to urban chiefs–local elites who are key authorities in Kananga and across sub-Saharan Africa–are also more likely to demand a land title, though not more likely to obtain one. We also find evidence that chiefs' political connections reduce citizens' likelihood of obtaining a formal title.

We show that these patterns are hard to reconcile with alternative accounts that attribute higher take-up to latent demand for social insurance or to social networks facilitating access to titles. In our setting, participation in social institutions is only weakly related to indicators of insurance needs and does not predict completion of the titling process, suggesting that higher demand reflects a desire to exit costly social institutions rather than demand for insurance.

We then examine the causal effects of the land titling program. On average, the program crowded out citizens' participation in horizontal social institutions and worsened their evaluations of city chiefs. This pattern is unlikely to reflect disappointment with the titling process, as program assignment also reduced participation in social institutions unrelated to chiefs and did not worsen citizens' assessment of government performance.

Taken together, the results on take-up and reduced-form effects are more consistent with an exit interpretation–whereby citizens seek to escape the costs imposed by social institutions by formalizing their land–than with alternative explanations. They point to a distinctive logic of land formalization in urban areas: in the absence of accessible alternatives, citizens participate in social institutions; when a formal alternative becomes available, they may exit those institutions. By showing that land formalization both shapes and is shaped by social institutions, our results support a deeply political conception of land property rights (Bates, 1987; Boone, 2014; Levi & Russell, 2025).

This article contributes to three strands of literature. First, we contribute to a large literature on the interaction between formal and informal institutions in contexts characterized by overlapping or competing authority (Brenner, 1976; Cheema et al., 2006; Gottlieb et al., 2025; Henn, 2023; Migdal, 1988; Van der Windt et al., 2019; Weigel, 2020; Wilfahrt, 2018). In the context of land titling, previous studies have shown that informal institutions can substitute for formal land rights in rural areas (Harris & Honig, 2023; Honig, 2022). We build on and expand this literature in several ways. Unlike observational studies, we leverage a large urban land titling field experiment that allows us to estimate credible causal effects on participation in social institutions. Our empirical setting also enables us to observe take-up and estimate causal effects in the same context. Whereas most prior work focuses on one type or the other, we study both horizontal and vertical social institutions. Finally, because we observe both initiation and completion of the titling process at the individual level, we can separate the factors that foster demand for titles from those that constrain their acquisition.

Second, this article speaks to the literature on the role of local elites in low-capacity states. Scholars have emphasized the importance of such elites for governance (Acemoglu et al., 2014; Baldwin, 2016; Baldwin & Raffler, 2019), law and conflict resolution (Acemoglu et al., 2020), and land administration (Banerjee & Iyer, 2005; Boone, 2014; Goldstein & Udry, 2008; Honig, 2017, 2022; Ribar, 2026). In the context of land politics, scholars have argued that chiefs, as representatives of customary institutions, have a vested interest in maintaining their authority and therefore may oppose titling (Honig, 2022). Our findings suggest caution in extending arguments about the role of chiefs in land titling from rural to urban settings.

Finally, this article adds to the literature on the effects of land titling programs (Besley, 1995; Di Tella et al., 2007; Djankov et al., 2020; Field, 2005, 2007; Galiani & Schargrodsky, 2010; Goldstein et al., 2018; Goldstein & Udry, 2008; Hornbeck, 2010). Previous land titling field experiments have focused on rural areas (Goldstein et al., 2018), while the best evidence on urban titling comes from quasi-experimental studies of slum and squatter communities in Peru and Argentina (Di Tella et al., 2007; Field, 2005, 2007; Galiani & Schargrodsky, 2010). Recent work documents effects of formal titling on beliefs (Di Tella et al., 2007), political views (de Janvry et al., 2014), moral attitudes and prosocial behavior (Dari-Mattiacci & Fabbri, 2023; Fabbri, 2021), and trust in state institutions (Klaus, 2020). We present, to our knowledge, the first experimental estimates of the social effects of land titling. Specifically, we provide field-experimental evidence that a city-wide land titling program crowded out participation in informal institutions. This evidence suggests that formal property rights can alter social relationships (Bates, 1987). While recent survey experiments suggest that titling may dampen the cooperative benefits of social institutions (Harris & Honig, 2023), our results show that urban residents may exit informal arrangements when formal alternatives become available.

Social Institutions and Land Formalization

Formalization efforts interact with social institutions–rules and roles that govern relationships and structure activities within a community (Harris & Honig, 2023; Lust, 2022; Lust & Rakner, 2018). Such institutions are often identified as a crucial factor behind variation in demand for formal titling and frictions in the implementation of titling programs (Boone et al., 2021). To guide our analysis, we distinguish between two types of social institutions: horizontal and vertical, depending on whether citizens have obligations to individuals of similar or higher social standing (Harris & Honig, 2023; Lust & Rakner, 2018). Neighborhood and church networks are examples of the former; customary authorities–organized hierarchically–are examples of the latter. These institutions share two features. First, they help provide collective goods and informal insurance, as documented in diverse contexts such as Nigeria (Akinola, 2008; Udry, 1990), Zambia (Baldwin, 2016), Tanzania (De Weerdt & Dercon, 2006), India (Townsend, 1994), the Philippines (Fafchamps & Lund, 2003), and China (Tsai, 2007; Xu & Yao, 2015). Second, social institutions are costly, often requiring citizens to incur monetary and in-kind obligations. That is, they involve extraction and create ties of social dependence (Lust & Rakner, 2018; Olken & Singhal, 2011).

Horizontal Social Institutions

Networks and groups outside the state play a central role in public life in Africa (Chazan et al., 1999; Gulliver, 1971; Hyden & Williams, 1994). These institutions provide insurance, regulate access to land (Berry, 1989, 1993; Ostrom, 1990), and, in the absence of formal titles, may confer tenure security (Bromley, 2009; Deininger & Feder, 2001; Durand-Lasserve & Royston, 2002; Honig, 2022; Lawry et al., 2017).

Participation, however, is costly. Cooperation rests on reciprocity and mutual dependence (Harris & Honig, 2023; Kpessa-Whyte, 2018; MacLean, 2010), entails monetary obligations, and is enforced through social and economic sanctions (Barkan & Holmquist, 1989; Dercon et al., 2006; Lust & Rakner, 2018; Migdal, 1988). Some institutions impose egalitarian norms that penalize investment (Kennedy, 1988; Platteau, 2014). These costs may generate incentives to seek institutional alternatives, particularly in urban settings where land values are higher (Lall et al., 2017) and customary institutions and their insurance benefits are weaker (Honig, 2022).

Vertical Social Institutions

Traditional and urban chiefs play a central role in local governance (Baldwin & Holzinger, 2019; Baldwin & Raffler, 2019; Logan, 2009), contributing to public goods (Baldwin, 2016), administering justice (Sheely, 2013), and controlling land (Baldwin, 2014; Boone, 2014; Honig, 2017, 2022; Ribar, 2026). Urban chiefs are common in sub-Saharan Africa–including in the DRC, Ghana, Gabon, Sierra Leone, Zimbabwe, and Tanzania (Gutkind, 1966; Soulas de Russel, 1998; Tieleman & Uitermark, 2019)–where they often complement the formal state (Henn, 2023) and derive their authority from customary legitimacy (Logan & Katenda, 2021).

Two features of chiefs matter for land titling: their connections with citizens and their connections with politicians. Evidence shows that chiefs selectively provide protection and tenure security (Goldstein & Udry, 2008; Honig, 2017, 2022) in exchange for rents and state recognition of their neo-customary status (Acemoglu et al., 2014; Boone, 2014). While prior work emphasizes chiefs' capacity to deliver collective goods (Baldwin, 2013), such informal protection is often contingent on chiefs' incentives and may foster clientelistic dependence (de Janvry et al., 2014; Larreguy et al., 2018; Mattingly, 2016). Because urban chiefs are intermediaries between citizens and the state, they face competing demands, generating distinctive predictions about demand for land titles and their acquisition.

Demand for Land Titles

Most existing accounts explain demand for formal land titles with an insurance logic: because social institutions provide tenure security and risk-sharing, citizens have weaker incentives to formalize (Deininger & Feder, 2001; Honig, 2022). Furthermore, introducing formal titling might reduce the insurance pool, prompting potential titleholders to avoid acquiring titles to maintain membership benefits and avoid sanctions (Harris & Honig, 2023). Evidence suggests that this logic is prevalent in rural areas with strong customary institutions, where both citizens and chiefs seek to preserve their status within those institutions (Honig, 2022). Under this view, participation in social institutions should be associated with lower demand for titles.

Building on the dual nature of social institutions–providing insurance and imposing costs–we propose that citizens face a trade-off between the benefits of informal insurance and the costs of social extraction. We argue that in urban settings, where social institutions are particularly costly and their insurance benefits are weak relative to land values, these costs dominate, favoring formalization: citizens' choices should follow an exit logic.[5] Central to this argument is the notion that substitution is imperfect: citizens participate in social institutions as long as they lack access to alternatives. A lack of alternatives may reflect either an absence of options or their inaccessibility in practice–for example, if the price of a formal land title is prohibitively high. When offered the chance to formalize, citizens who participate more in social institutions–and bear their costs more acutely–are more likely to demand formal land titles. Upon formalization, citizens may seek to exit the informal equilibrium to avoid the costs of social institutions. That is, formalization should crowd out participation in social institutions. Therefore, formal land rights can function as an institutional bypass–an alternative institutional regime that provides citizens with a pathway around the existing institution without changing it (Prado & Trebilcock, 2018).

Acquisition of Land Titles

Demand, however, does not guarantee acquisition. Whether citizens who initiate the formalization process obtain a title depends on their ability to navigate bureaucratic procedures and on the incentives of intermediaries (Kruks-Wisner, 2018; Rizzo, 2025). Social institutions may facilitate information diffusion, provide connections, and offer bureaucratic know-how (Rizzo, 2025), helping citizens complete the formalization process. Under a facilitation account, participation in social institutions should predict not only higher demand but also higher rates of completion, conditional on initiation. By contrast, the exit logic we propose predicts that citizens seek titles despite their institutional ties, not because of them. If our argument is correct, participation in social institutions should not predict completion, conditional on initiation.

The distinction between demand and acquisition is particularly important for understanding the role of chiefs. Chiefs occupy a dual position: they maintain ties with both citizens and politicians. As development brokers (Baldwin, 2013), chiefs might help citizens obtain titles: citizens closer to chiefs might leverage their connections to navigate the titling process, so that proximity to chiefs would increase both demand and acquisition. But chiefs embedded in political networks may obstruct formalization to preserve clientelistic ties or avoid antagonizing government officials. Under this logic, demand and acquisition diverge: proximity to chiefs may increase demand (citizens want to escape dependence), but acquisition may fall insofar as chiefs have political incentives to stifle formalization. Put differently, chiefs' proximity to citizens may raise initiation while their political connections may depress completion.

Empirical Implications

Our argument entails the following empirical implications:

> **Take-up and horizontal institutions:** Citizens who participate more in social institutions should be more likely to demand formal land titles.
> **Take-up and vertical institutions:** Citizens' connections to chiefs should increase demand, but chiefs' political connections should decrease acquisition of land titles.
> **Crowding-out:** Program assignment should crowd out participation in social institutions.

These implications differ from those of the insurance logic. If social institutions provide sufficient insurance, citizens who participate more in them should exhibit lower demand for titles–they can do without formal titles. Furthermore, if they do formalize, they would seek to retain the insurance benefits of social institutions rather than exit those institutions. By contrast, the exit logic predicts both higher demand among those who participate more in social institutions and crowding-out upon formalization.

Spatial Heterogeneity

The relative strength of these mechanisms likely depends on the strength of customary institutions and their associated tenure regimes, which exhibit spatial variation (Boone, 2014). Where customary institutions are strong and land values are low–as in rural areas–the insurance benefits of social institutions outweigh their costs, and the insurance motive applies. Where customary institutions are weaker and land values are higher–as in urban areas–the exit logic is more likely to apply. Areas that more closely resemble rural settings, such as the urban periphery or zones under customary control, should therefore more closely approximate the insurance logic. We examine the scope conditions of our argument using spatial variation within the city by studying program take-up in peri-urban customary areas known as *chefferies*.

By doing so, we contribute to understanding how different land regimes shape land formalization (Levi & Russell, 2025).

Land and Social Institutions in Kananga, D.R. Congo

Land Formalization and Tenure Regime

The DRC is the fourth most populous country in Africa and one of the poorest. It has low fiscal capacity, with a tax-to-GDP ratio below the sub-Saharan African average and, historically, one of the lowest in the world (World Bank, 2026). Less than 1 percent of land is formally registered (Huggins et al., 2004). Kananga, the capital of the Kasaï Central Province and the setting for this study, is a city with roughly 1.6 million inhabitants–the fourth largest in the DRC–and an average monthly household income of $106 (PPP$168). Because of its size and urban form, Kananga can be considered a typical city in Francophone Africa, with an administrative center built around the colonial city of Luluabourg and an expanding, patchwork-like periphery (Baruah et al., 2021).

Citizens of Kananga are well aware of the legal benefits of land titles. Titles are highly valued, and some citizens undertake great efforts to obtain one, sometimes paying high legal fees.[6] However, very few citizens–only 15 percent–hold a state-recognized formal land title.[7] This low rate of formalization reflects the fact that the current procedure for obtaining a title is difficult and costly.[8]

The absence of formal land ownership creates a wide range of problems for both citizens and the government. For the government, the dearth of property ownership information inhibits tax collection and public goods provision (Weigel, 2020). In turn, citizens face the risk of expropriation–over 30 percent of respondents in our sample reported experiencing at least one property dispute, and over 60 percent[9] knew at least one person who did. Lastly, while banks in Kananga accept land titles as collateral for loans, the vast majority of the population is effectively barred from the formal financial sector because of the scarcity of official land titles.

Horizontal Social Institutions

Citizens of Kananga participate in multiple overlapping horizontal social institutions. In urban areas, churches and burial societies help organize risk sharing (Auriol et al., 2020; Dehejia et al., 2007; Dercon et al., 2008). As in many parts of Africa, religious institutions of several denominations feature prominently in Kananga. Church attendance is high: 64.5 percent of citizens in our sample report attending every day, and 24 percent report attending multiple times per week.[10] Citizens also participate in mutual aid societies and rotating savings and credit associations (ROSCAs). Other horizontal obligations include monetary contributions to community events such as weddings and funerals.

Quantitative Evidence on the Cost of Social Institutions. The costly nature of social institutions is apparent in our setting. First, citizens of Kananga routinely make monetary or in-kind payments to horizontal institutions. Payments to churches, weddings and funerals, and an informal labor tax known as *salongo*–during which citizens help repair roads, bridges, and other local public goods–together amount to roughly 11.5 percent of citizens' monthly income (Figure 1).[11]

Second, horizontal institutions in Kananga do not appear, in principle, to provide an effective substitute for secure land rights, as citizens frequently experience tenure insecurity. Moreover, there is no correlation between participation in such institutions and a range of welfare indicators, including tenure security, access to health care, education, or retirement savings (Supplemental Information (SI) Table F.1).[12]

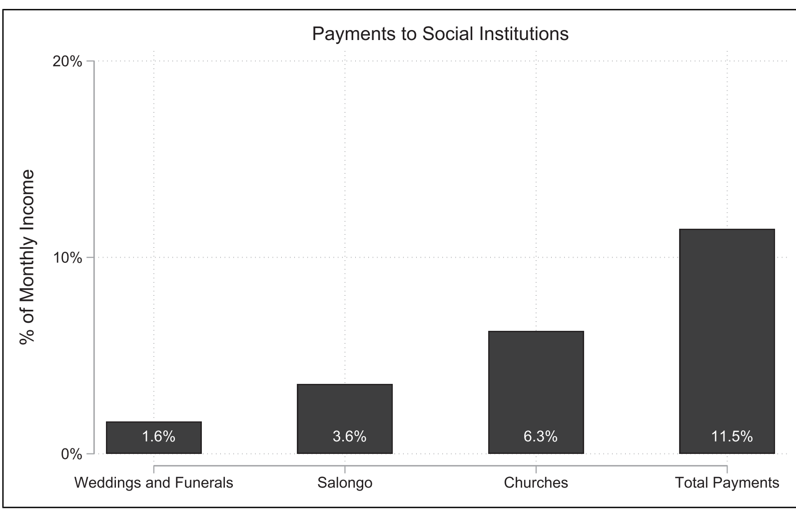

Figure 1. Payments to social institutions as a percentage of citizens' monthly income. *Notes.* Each bar represents the expenditures in each category as a fraction of monthly income. All measures of expenditure and income are winsorized by trimming the top and bottom fifth percentile of observations.

Qualitative Evidence on the Cost of Social Institutions. Evidence from focus group discussions sheds additional light on the logic and costs of contributions to social institutions. These discussions highlight three common features: (1) progressivity; (2) social sanctions; and (3) asset-concealing behavior. Contributions are associated with a “spirit of solidarity” deemed characteristic of Congolese culture. Focus group respondents also describe an insurance motive: contributions are often triggered by external circumstances such as weddings, mourning, damaged ravines, community needs, and natural disasters. Contributions are usually collected through door-to-door soliciting, especially by local notables or people linked by social ties. Not everyone is expected to contribute equally–expectations are shaped by a progressivity norm, and door-to-door solicitations tend to target wealthier households. Notably, some respondents mentioned that wealthier citizens tend to hide their assets (“salary is secret”). In this context, a land title may be seen as a wealth-signaling asset. While respondents emphasize that citizens are not expected to contribute beyond their means, they describe social consequences for failing to contribute, including mistrust, losing community ties, gossip, and ostracism. One respondent emphasized that those who do not contribute “will not be trusted by the community”; another mentioned a “burden of conscience.” A third respondent highlighted the loss of community ties and isolation from community events.

Vertical Social Institutions: City Chiefs

As in many urban areas of Africa, in Kananga city chiefs (*chefs d’avenue*, *chefs de quartier*, *chefs de localité*) are a distinctive social institution. These chiefs are local notables whose main responsibilities include mediating local disputes, especially over property, and helping maintain local infrastructure through *salongo*.

While nominally integrated into the state apparatus,[13] city chiefs share many characteristics with customary chiefs in terms of their activities, nomination process, and social standing. Chiefs are nominated by elders in the neighborhood–typically for being longstanding and respected residents–and then rubber-stamped by the government. Chiefs have indefinite and often lifelong tenure, which at times passes through families, and deposition is rare.[14] Chiefs do not receive regular salaries, and most hold other remunerative positions, for example as teachers or pastors. The main benefit of being a chief is the status it confers.

Intervention Description

Formal Land Titles

In collaboration with the Provincial Government of Kasaï Central, we subsidized the three main land titles in the DRC: *Certificat d'Enregistrement* (CE), *Contrat de Location* (CL), and *Acte de Vente Notarié* (AVN). These titles are listed in decreasing legal weight. All three titles grant higher tenure security. The program randomly offered households the opportunity to obtain one of these three formal titles at the prices listed in Table 1.[15] The reduced prices imply a substantial subsidy. Given that citizens pay up to $1,000 for the CE, the title with the highest legal value, an average subsidized price of $75 implies a 92.5 percent price decrease. Program activities began in July 2017 and continued until February 2020 (SI Figure A.1).

The magnitude of the subsidy offered through the program is comparatively large. The costs of registering property in Africa are the highest in the world–estimates range from 9 percent (Lall et al., 2017) to about 15 percent (Toulmin, 2009) of the property value. Given that the average price for a *Certificat d'Enregistrement* offered during the program was $75 and the average predicted property value in the eligible sample is about $2,900, the cost of a title represents 2.5 percent of the average property value–bringing it closer to the cost of registering property in Europe (2.8 percent) (Lall et al., 2017).

1. ***Certificat d'Enregistrement***. The CE represents the government's formal recognition of a property owner's rights to their plot of land. The acquisition of a CE requires that the land be sufficiently put to use–10 percent of the plot must contain buildings made of solid materials. Having a CE implies that the property owner faces no legal challenges to their property rights.
2. ***Contrat de Location***. A CL also entails the government's recognition of the owner's right to the land. However, the CL is a contract with the

Table 1. Average Subsidized Price of Each Formal Land Title

Document	Average price
Certificat d'Enregistrement	75 USD
Contrat de Location	40 USD
Acte de Vente Notarié	20 USD

Notes. Average price levels for each land title in the program.

government under which the property owner is expected to make annual payments over the course of three years. At the end of this period, if the land is sufficiently put to use, the government will grant the owner a CE.
3. ***Acte de Vente Notarié***. An AVN constitutes proof of acquisition of a plot, but it does not confer the legal protections associated with a registered property right. Notarization renders the AVN a legally recognized sales contract, which can be useful if the owner plans to sell the plot and may carry more evidentiary weight in case of a land dispute.

Eligibility

The initially eligible population, as determined by the Land Titling Office, consisted of citizens in possession of at least one formal land title, including some from the colonial era.[16] Thus, the intervention allowed citizens (1) to update their legacy titles by obtaining a title currently recognized by the state or (2) to upgrade their title by obtaining a title with higher legal weight (for example, an upgrade from *Acte de Vente* to *Certificat d'Enregistrement*). Following a government change in eligibility rules that introduced stricter documentation and verification requirements–including a minimum built area, possession of original versions of prior titles, and recognition of a narrower set of documents–some initially eligible households became in-eligible. We therefore restricted the analysis sample using baseline characteristics to match the revised criteria. The new sample included 483 households. Although this eligibility restriction was costly in terms of sample size, it did not compromise balance (Table 2) and focused the analysis on the population relevant for understanding the demand for land titling in urban Africa. The initially eligible sample was generally balanced across owner and household characteristics (SI Table I.1). While attrition was slightly higher among control households, we do not find that attriters differ substantially in their characteristics across treatment groups (SI Table I.2).[17]

Randomization

Randomization was implemented at the household level among households who were eligible and interested in the program. The units of randomization are households located in polygons (or neighborhoods). Each polygon was defined using satellite imagery to approximate the finest administrative unit, the *localité*, based on boundaries such as roads, ravines, and other natural features easily identifiable from the ground (SI Figure K.1).

Table 2. Descriptive Statistics and Randomization Balance

	Control			Treatment			
	Observations	Mean	SD	Observations	Mean	SD	Difference in means
Age	228	54.43	15.91	254	55.65	15.00	1.215
Female	229	0.26	0.44	254	0.20	0.40	−0.053
Years of education	229	10.72	3.54	254	11.45	3.62	0.724**
Household size	228	6.33	4.08	254	6.78	4.52	0.447
Years residing in Kananga	194	45.75	19.77	234	46.98	17.85	1.231
On electrical grid	229	0.03	0.16	254	0.05	0.21	0.021
House near ravine	227	0.20	0.40	254	0.19	0.39	−0.014
Predicted property value (USD)	229	2593.71	3790.29	254	3090.92	3642.97	497.215
Monthly income (USD)	229	122.76	443.88	254	123.08	230.83	0.320
Recent expenditure (USD)	228	3.99	19.85	254	3.37	5.90	−0.616
Business owner	229	0.22	0.41	254	0.19	0.39	−0.029
Trust in provincial government	229	2.55	1.20	254	2.44	1.24	−0.111
Political party member	229	0.30	0.46	254	0.33	0.47	0.025
Frequency of land disputes	229	0.95	6.04	254	0.66	1.46	−0.286
Helps with community security	229	2.22	9.55	254	1.28	3.47	−0.943
Ever paid property tax	229	0.37	0.48	254	0.44	0.50	0.066
Affected by militia violence	227	0.35	0.48	253	0.41	0.49	0.055

Notes. Averages of selected covariates at baseline for the treatment and control groups. The last column is the coefficient of a bivariate regression of treatment assignment on each variable measured at baseline. Militia Violence refers to fighting that broke out in 2017 between the national government and *Kamuina Nsapu* militias, leaving thousands dead and hundreds of thousands displaced.

Kananga contains 364 such neighborhoods. After completion of baseline surveying in a given polygon, we randomly assigned treatment within that polygon, ensuring that an equal proportion of respondents were assigned to treatment and control groups. Survey teams then revisited households assigned to the treatment group and invited them to participate in the titling program, distributing flyers with information about each formal document offered during the program (SI Figure K.2). At a later stage, in response to government demands to increase the speed at which we registered participants, we adopted an alternative approach by embedding the randomization procedure directly into the baseline survey. The randomization achieved balance: only one of 17 variables in Table 2 (years of education) is imbalanced.[18]

Land Title Production Process

The production of the land titles issued during the program comprised the following steps:

1. **Technical visit**. Respondents assigned to the treatment group were invited to sign up for a technical visit with agents from each division involved in the program: the provincial Cadastral and Land Titling Offices. Agents were accompanied by an enumerator to ensure compliance with the randomization protocol. During this visit, cadastral agents measured the plot, drew a sketch, and determined the number of required cornerstones. They then produced a set of official documents describing the technical and legal aspects of the plot and required to process the title, including information on the full list of previous owners and the materials used to build the compound. This step was an important source of attrition. In many cases, properties were determined to be ineligible for an official land title for technical reasons.[19] Other respondents dropped out before the first visit because they lost interest or faced long waiting times.
2. **Cadastral Office**. A typist at the Cadastral Office was responsible for producing an official document–*procès-verbal*–based on the reports created during the technical visit and a letter describing the title requested, the contents of the file, the respondent's personal details, and reproductions of the plot sketches. A cadastral agent reviewed and signed the document, verifying that it reflected the observations made during the visit. The head of the Cadastral Office then examined the file and determined the respondent's eligibility for the requested title. If no issues were detected, the Cadastral

Office transferred a copy to the Land Titling Office. This step was also a source of attrition and delay: by the time the files reached the Land Titling Office, many respondents had moved, sold their plot, or lost interest.

3. **Land Titling Office**. Each file was sent to the Land Titling Office for legal review. The Land Titling Office is the government office responsible for land-law matters and determined whether the plot satisfied the technical requirements to be eligible for the title selected by the respondent. This step was a significant source of discretion for titling officials, who studied the full history of a plot's ownership and verified the authenticity of signatures contained in existing documents. Files were often rejected due to issues with these documents–the most common reason was insufficient proof of ownership by former occupants.
4. **Title payment and official signature**. The Land Titling Office then produced a document detailing the amount to be paid to the Provincial Tax Ministry. Respondents took this document to the bank, paid the fee, and received a receipt, which they brought back to the Land Titling Office. The head of the Land Titling Office then signed the official copies of the titles, which were delivered to respondents by enumerators. Finally, cadastral agents visited the plots to install the cornerstones.

Data

Our data come from the following sources:

1. **Respondent baseline survey**. We administered baseline surveys to 4,343 randomly selected households–12 per neighborhood–between July and December 2017. Independent enumerators randomly sampled compounds using skip patterns while walking down each avenue in a neighborhood: for example, by visiting every *X*th property, where *X* was determined by the estimated number of properties and a target of 12 per neighborhood. The survey instrument covered a range of topics, including demographics, property characteristics, governance, public goods, experience with taxation and other payments to the government, city chiefs, beliefs, and participation in social institutions.
2. **Respondent endline surveys**. We conducted two surveys after the titling program. Round 1 was conducted between March and September 2019, and Round 2 between December 2019 and February 2020. These surveys contained questions about property disputes and

tenure security, saving and investment behavior, engagement with formal and informal authorities, participation in social institutions, and views of and engagement with the government and city chiefs.

3. **Chief survey**. We administered surveys to over 1,000 city chiefs, measuring a set of characteristics, including education, official duties, relationships with city authorities, knowledge of citizens in their jurisdiction, power over land allocation, past experience collecting taxes, preferences for redistribution and public goods, and the organization of *salongo*. We matched chiefs to citizens based on whom respondents reported as their chief during the endline survey, using unique identifiers.
4. **Administrative data on land titling**. We use administrative data from the Cadastral and Land Titling Offices of the Provincial Government of Kasaï Central. These data contain information on all households who opened a file, regardless of whether they completed the process and received a title. We define two variables:

   Initiation of titling process: An indicator of whether households initiated the land titling process during the study period, defined as opening a file at the Land Titling Office. This was a costly step that required households to (1) schedule a technical visit from government land surveyors and (2) be present during the visit so that government agents could open the household's file. For control households, we verified initiation by cross-checking the list of respondents against the same administrative registry at the Land Titling Office.

   Receipt of land title: An indicator of whether households received a land title during the study period. We merged the government's administrative data on recently finalized titles with our household surveys. We also coded this variable as one if a respondent–whether assigned to treatment or control–reported obtaining a new title at endline since the start of the land titling program and was able to show the title to an enumerator.

Results

First Stage: Effects of the Titling Program on Land Formalization

We first study the effect of assignment to the land titling program on the probability that citizens formalize their property. As noted above, we examine whether citizens initiated the titling process and whether they ultimately received a title within the time window considered. We estimate the following equation:

$$Y_i = \beta_0 + \beta_1 Program_i + u_i \quad (1)$$

where Y_i denotes our two measures of take-up, i indexes households, and $Program_i$ is an indicator for households randomly assigned to the program. We report robust standard errors, as randomization was conducted at the household level.

Assignment to the land titling program caused a 44 pp increase in the probability that citizens initiated the titling process (Figure 2). Citizens assigned to the program were 13.7 pp more likely to obtain a title during the period considered (from July 2017 to July 2019). Very few citizens in the control group attempted to open a file.[20] By contrast, when assigned to the door-to-door titling program, nearly half of citizens initiated the titling process by scheduling a visit from government land surveyors. This stark difference strongly suggests that the monetary and transaction costs of obtaining a title were binding constraints on land formalization prior to the program.[21]

Next, we study whether demand for formal land titles and their acquisition depend on socioeconomic factors. We estimate heterogeneous effects of treatment assignment on our two measures of take-up–initiation and completion of the land formalization process–using the following equation:

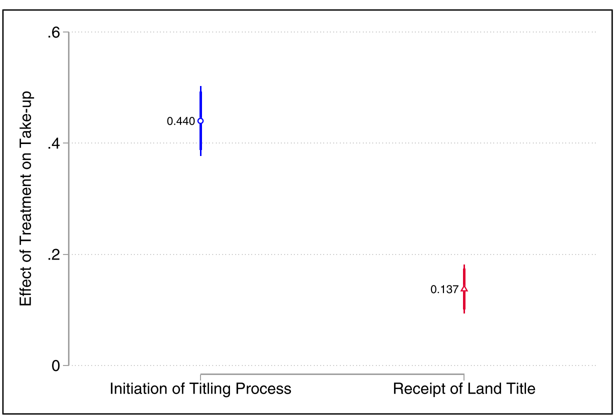

Figure 2. Treatment effects of the land titling program on initiation of the titling process and receipt of land titles.
Notes. Intent-to-treat (ITT) estimates from equation (1). Thicker and thinner lines are 90 and 95 percent confidence intervals, respectively. N = 483. See SI Table D.1 for more details.

$$Y_i = \beta_0 + \beta_1 \text{Program}_i + (\text{Program}_i \times \mathbf{Z}_i)\beta_2 + \mathbf{Z}_i\beta_3 + u_i \tag{2}$$

where Y_i denotes one of our two measures of take-up, and $\mathbf{Z}_i$ is a vector of individual or household characteristics[22]–income, gender, education, and machine-learning estimates of property value.[23] The estimates in Figure 3 show that socioeconomic factors–income, education, and property value–are strongly and positively associated with formalization, consistent with economic models of land property rights (Alston et al., 1996; Miceli et al., 2001). Notably, for each significant coefficient in this figure–property value, income, and education–there is a gap between demand and actual completion of the formalization process, which likely reflects the bureaucratic obstacles in the titling process described above. The analysis also reveals that migrants are marginally less likely to demand a land title, possibly because they participate less in–and are thus less dependent on–social institutions.

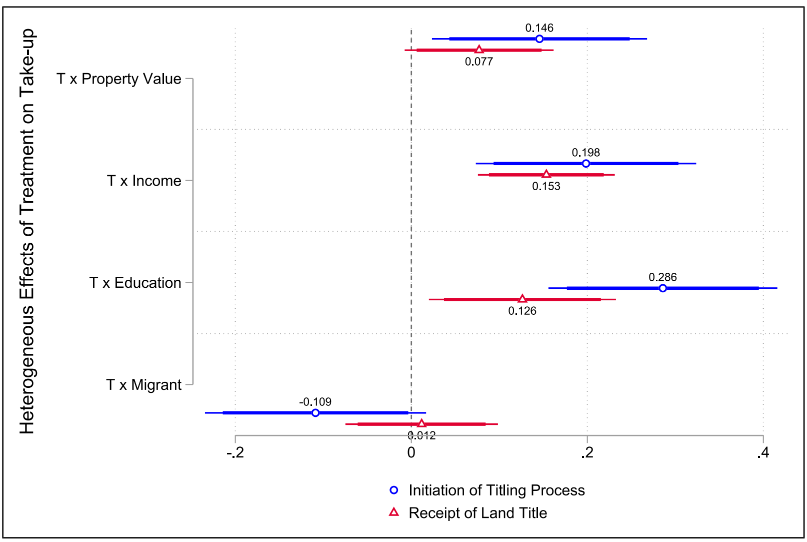

Figure 3. Heterogeneous treatment effects of the land titling program on initiation of the titling process and receipt of land titles, by socioeconomic characteristics.
Notes. OLS estimates from equation (2). Point estimates represent the interaction term between assignment to the program and dichotomous measures of respondents' and households' characteristics. Thicker and thinner lines are 90 and 95 percent confidence intervals, respectively. See SI Table D.2 for more details.

Heterogeneous Adoption of Titling: Land Formalization Is Moderated by Social Institutions

Here, we test the first empirical implication of our argument by studying which citizens are more responsive to a randomly assigned offer to formalize their land. All specifications are based on equation (2) and include interactive controls for income, gender, education, and predicted property value. Our estimates show how the treatment effect of assignment to the titling program varies with pre-treatment participation in social institutions. While participation in social institutions is not randomly assigned–and therefore the estimates do not have a fully causal interpretation–these results offer insight into how social institutions shape demand for land titles.

Horizontal Social Institutions

We first study heterogeneous take-up of titling conditional on citizens' participation in horizontal social institutions. We consider four of the most important such institutions in Kananga–participation in ROSCAs, participation in mutual aid societies, church contributions, and contributions to weddings and funerals. Participation in all but one of these institutions significantly moderates demand for titles. Heterogeneity in completion is limited: ROSCA participation and contributions to weddings and funerals show small, positive interactions (Figure 4, SI Table D.3). These results are consistent with our argument that participation in social institutions increases demand for formalization. We return to these patterns below to address two alternative explanations: that higher take-up reflects latent demand for insurance, and that social institutions help citizens navigate the formalization process.

Vertical Social Institutions

Connections to Chiefs. We now study heterogeneity in the treatment effect by measures of citizens' connections with chiefs, using unique identifiers to exactly match each respondent to the person they report as their chief. Connections to chiefs are generally predictive of demand for titles but not of completion (Figure 5, top panel). Treated citizens who know their chief's name are more likely to initiate the titling process. The interaction for knowing a chief's phone number is positive but imprecisely estimated. In turn, treatment effects on initiation are significantly larger for citizens whose chief has long tenure in the neighborhood (more than 10 years), consistent with established chiefs being more visible and influential to residents.

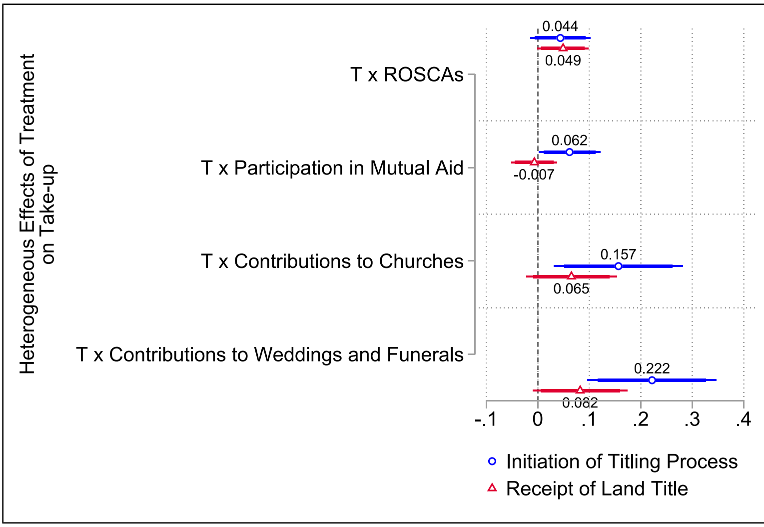

Figure 4. Heterogeneous effects of treatment assignment on initiation of the titling process and receipt of land titles, by participation in horizontal social institutions. *Notes.* OLS estimates from equation (2). Point estimates are the interaction term between assignment to the program and dichotomous measures of respondents' participation in ROSCAs, mutual aid societies, contributions to church, and contributions to weddings and funerals. All specifications are estimated using OLS and interactively control for income, gender, education, and property value. Thicker and thinner lines are 90 and 95 percent confidence intervals, respectively. See SI Table D.3 for more details.

Notably, trust in chiefs does not predict demand for or acquisition of land titles (SI Table F.8). These results support the idea that citizens may view chiefs as brokers who are well-positioned to deliver benefits (Baldwin, 2013).

Chiefs' Political Connections. Chiefs' political connections may also affect demand for and acquisition of formal land titles. None of these characteristics are predictive of demand, but they do affect whether citizens obtained a land title (Figure 5, bottom panel). Citizens whose chiefs are party members are less likely to obtain a land title–the effect is more pronounced for those affiliated with the ruling party, the People's Party for Reconstruction and Democracy (PPRD). Moreover, citizens whose chiefs are more active in the organization of *salongo*–a proxy for chiefs' social power–are less likely to succeed in obtaining a land title. While citizens may think that chiefs can help them obtain a title, the fact that politically connected and more powerful

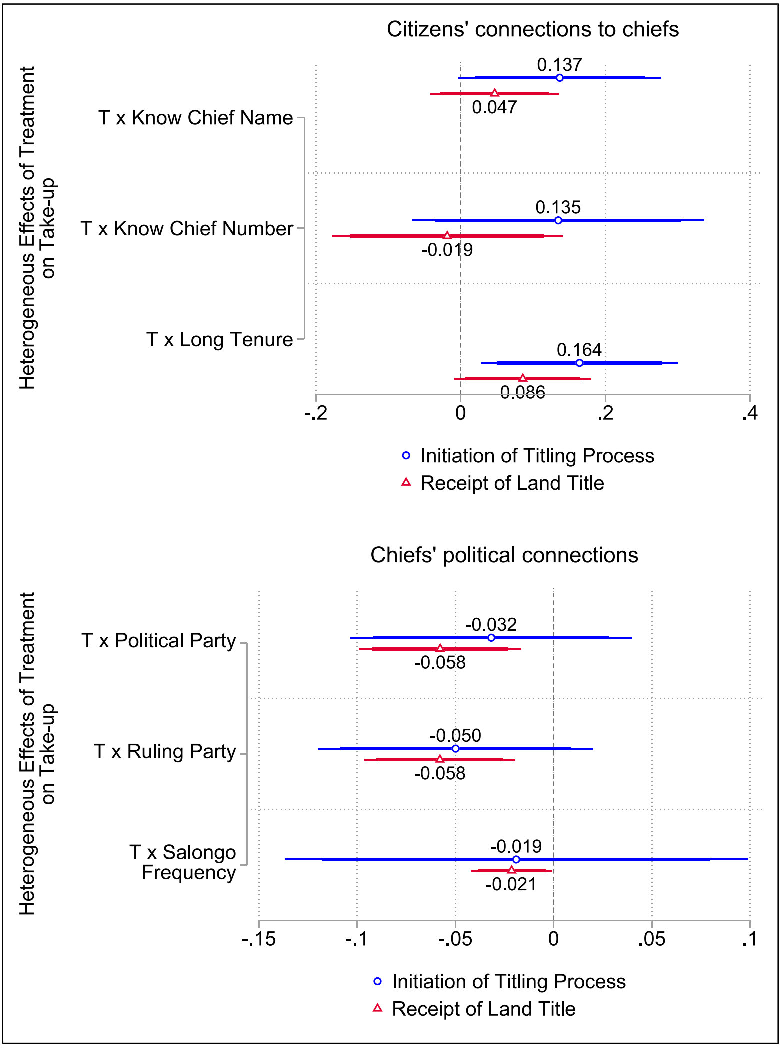

Figure 5. Heterogeneous effects of treatment assignment on initiation of the titling process and receipt of land titles, by citizens' connections to chiefs (top panel) and chiefs' political connections (bottom panel).

Notes. OLS estimates from equation (2). Point estimates are the interaction term between assignment to the program and dichotomous measures of citizens' or chiefs' characteristics. All specifications are estimated using OLS and interactively control for income, gender, education, and property value. Thicker and thinner lines are 90 and 95 percent confidence intervals, respectively. See SI Tables D.4 and D.5 for more details.

chiefs appear to stifle titling suggests a divergence between citizens' and chiefs' incentives, consistent with the idea that chiefs may be offering protection in the context of clientelistic relationships (Acemoglu et al., 2014; de Janvry et al., 2014; Peyton, 2020).

Spatial Heterogeneity: Customary Areas

To examine the scope conditions of our argument, we leverage spatial variation within Kananga. Four peripheral areas (*chefferies*) have customary chiefs, weaker state presence, and stronger customary institutions–conditions resembling the rural settings that dominate the literature. In these areas, no titles were delivered during the study period. Consistent with this, SI Table E.1 shows that the treatment effect on completion is significantly smaller in customary areas than in the rest of Kananga. Chiefs in customary areas are perceived as more responsive and less accountable–chiefs themselves are less likely to think they can be fired–and are more active in organizing *salongo*; differences in trust in chiefs are positive but imprecisely estimated (SI Table E.2). Taken together, these patterns are consistent with a "neocustomary" equilibrium in which chiefs may have incentives to impede titling to preserve their authority (Honig, 2022).

Reduced-Form Effects of the Titling Program on Social Institutions

This section tests the second implication of our theory: that the titling program should crowd out–rather than reinforce–participation in social institutions. We present reduced-form effects of the program on participation in horizontal and vertical social institutions, measured at two points in time, using equation (1) (Y_i denotes program outcomes). The first endline survey (Round 1) was conducted from March to September 2019, shortly after the delivery of most titles. A second endline survey (Round 2) was conducted from December 2019 to February 2020, an average of 6–8 months after title delivery.

The estimates in Figure 6 show that the program reduced participation in horizontal social institutions and worsened evaluations of vertical social institutions, with both indices becoming marginally significant at the 10 percent level in Round 2. The top two coefficients show the reduced-form effect of the program on an index comprising participation in mutual aid societies, ROSCAs, contributions to churches, and contributions to weddings and funerals. The bottom coefficients correspond to views on chiefs, separately for each endline round.[24]

As shown in Figure 7 (top panel), the crowding-out effects are concentrated in participation in mutual aid societies, ROSCAs, and church

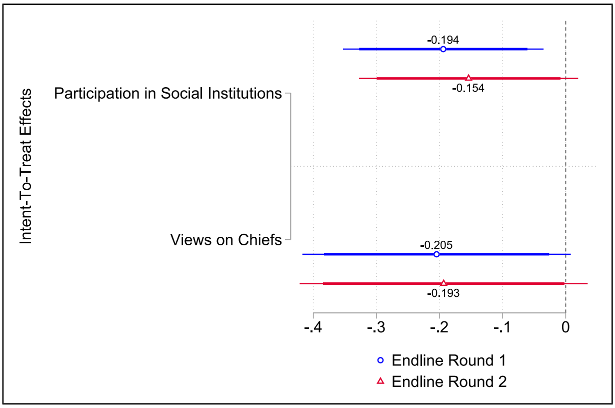

Figure 6. Reduced-form effects of the program on indices of participation in social institutions and views of chiefs.
Notes. ITT estimates from equation (1). Each row displays two estimates: a circle marker for Round 1 and a triangle marker for Round 2. The top row displays estimates of standardized indices of participation in horizontal social institutions at each endline round. The bottom row displays estimates of standardized indices of respondents' views of chiefs: the Round 1 index comprises overall evaluation, importance, and responsiveness of the chief, trust in the avenue chief, and *salongo* participation; the Round 2 index comprises trust in the avenue chief, trust in the neighborhood chief, and *salongo* participation. All specifications are estimated using OLS and control for income, gender, education, and property value, as well as for baseline measures of the outcome when available. Thicker and thinner lines are 90 and 95 percent confidence intervals, respectively. See SI Table D.6 for more details.

contributions. For example, participation in mutual aid falls by about 6 pp (roughly 20 percent), though this effect is imprecisely estimated, and participation in ROSCAs falls by about 7.5 pp in Round 2 (roughly 23 percent). The clearest evidence of crowding-out is the significant decline in the overall social institutions index. Turning to vertical institutions, the bottom panel of Figure 7 shows significant effects on citizens' views of chiefs. Disaggregating by outcome and survey wave suggests a temporal pattern: declines in evaluations of chiefs–overall rating, perceived importance, and responsiveness–concentrate at Round 1, while trust in avenue and neighborhood chiefs remains unaffected at either round (Figure 7, bottom panel; SI Table D.8). In turn, *salongo* participation–a behavioral outcome–shows no effect at Round 1 but declines significantly by Round 2. The program did not alter citizens' evaluation of the provincial government, although they deemed it less responsive. It also made citizens more willing to appear legible to the state (SI Table F.10).

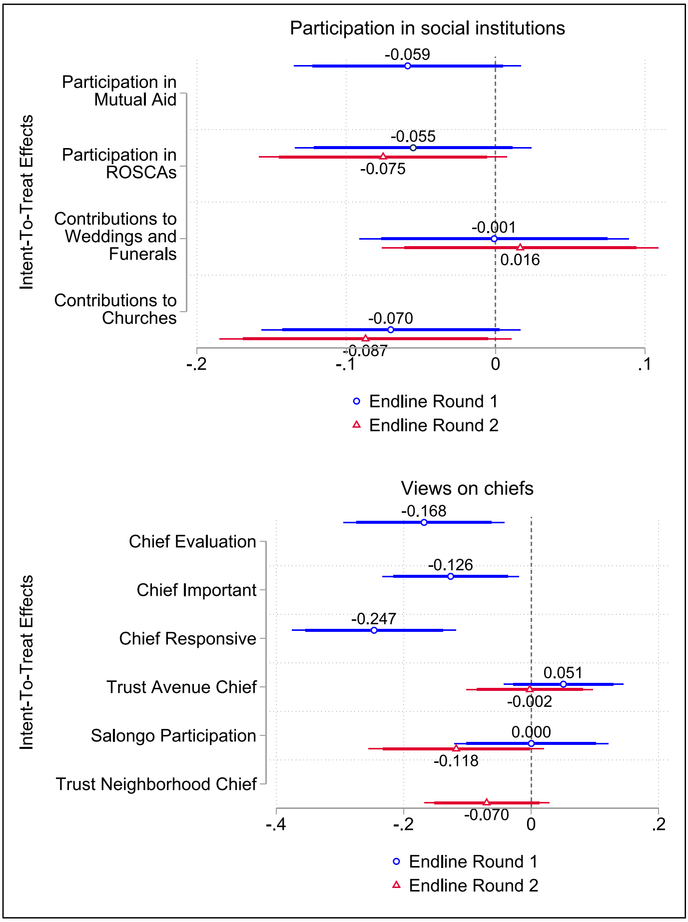

Figure 7. Reduced-form effects of the program on participation in social institutions (top panel) and views of chiefs (bottom panel).

Notes. ITT estimates from equation (1). Point estimates are standardized coefficients. All specifications are estimated using OLS and control for income, gender, education, and property value, as well as baseline measures of the outcome when available. Thicker and thinner lines are 90 and 95 percent confidence intervals, respectively. In both panels, circle markers denote Round 1 outcomes and triangle markers denote Round 2 outcomes. See SI Table D.7 and SI Table D.8 for more details.

These crowding-out results are, to our knowledge, the first evidence of the social effects of land titling: formalization can erode participation in social institutions. By contrast, the program shows no effect on citizens' perceived tenure security (SI Table F.2).[25] It also had no effect on civic participation, engagement with formal or informal authorities, or beliefs (SI Table D.9). Instead, it affected participation in key social institutions that entail monetary costs and social obligations.[26] These findings are consistent with recent work documenting that the introduction of microfinance crowds out participation in social networks (Banerjee et al., 2024) and that state welfare decreases caste-based insurance and depresses interactions among co-ethnics (Dixit, 2025). The worsening of attitudes toward chiefs suggests that formal titling can erode informal authority and relates to recent work on the effect of titling on trust in state institutions (Klaus, 2020). Overall, these results indicate that citizens may exit social institutions when alternatives become available, consistent with the idea that formalization can alter the informal equilibrium.

Alternative Explanations

Our argument is that citizens' demand for titles reflects a desire to exit social institutions to avoid costly obligations, and that crowding-out effects support this claim. We consider three alternative explanations: that demand for titling may reflect an underlying demand for social insurance; that social networks may facilitate titling; and that crowding-out effects may reflect disappointment with the titling process.

Demand for Social Insurance

A first possibility is that higher participation in social institutions reflects higher latent demand for social insurance. When land titles–a form of formal insurance–are prohibitively expensive, citizens with higher demand for insurance choose the social insurance afforded by social institutions. When titles become cheaper–as in the titling program we study–citizens are more likely to demand them. We provide five pieces of evidence against this interpretation.

First, in our context, social institutions appear to provide limited insurance on average. Across welfare outcomes, participation in these institutions is uncorrelated with tenure security perceptions, subjective well-being, or health access (SI Tables F.1 and F.2). The exception is hunger: the association is negative and marginally significant, consistent with limited informal insurance. Second, poor citizens–in terms of income–who might have greater demand for insurance are, in fact, less, not more, likely to participate in horizontal institutions (SI Table F.3). Third, as shown in Figure 4, demand is driven more by costly institutions–contributions to churches and to weddings and funerals–than by those that most clearly provide insurance–ROSCAs and mutual aid societies. Fourth, to more directly test whether the interaction between treatment assignment and participation in social institutions reflects demand for insurance, we estimate a triple interaction with baseline tenure insecurity (SI Table F.4). In the table, High SI denotes above-median participation in horizontal social institutions. The insurance mechanism predicts that the Treatment × High SI effect should be strongest among insecure respondents–those who arguably have the highest demand for insurance. Yet the opposite is true: among secure respondents, the Treatment × High SI coefficient is positive and statistically significant (0.252, $p < 0.01$), while the triple interaction Treatment × High SI × Insecure is negative (-0.242, $p < 0.1$). Among insecure respondents, the corresponding effect is approximately zero and statistically insignificant (0.252 - 0.242 = 0.010, $p = 0.92$). This pattern is consistent with an exit interpretation. The positive Treatment × High SI effect is driven by secure respondents who do not need social institutions for informal insurance; these citizens experience social institutions primarily as a cost and seek titles to exit. By contrast, insecure respondents may benefit from informal insurance afforded by social institutions and do not exit when formal titles become cheaper.[27] Finally, the crowding-out results are inconsistent with an insurance interpretation, which would predict retaining membership in social institutions as backup protection. Moreover, if the reduction in participation reflected substitution away from informal insurance, we would expect stronger effects among poorer households, who are more reliant on social insurance. Instead, we find no differential crowding-out by wealth, and wealthier households exhibit larger reductions in chief-related attitudes—consistent with those bearing higher costs from informal obligations being most responsive to the availability of formal alternatives (SI Table F.5).

Social Networks and Facilitation

Higher take-up among citizens who participate more in social institutions might reflect the fact that citizens who want a land title use these institutions to obtain one. Social institutions also comprise social networks, which might facilitate the diffusion of information and provide resources that citizens could use to obtain a title (Banerjee et al., 2013). We provide five pieces of evidence against this interpretation. First, if participation in social institutions proxied for social capital, it should also predict contact with government bureaucracies. With the exception of participation in civic associations, participation in horizontal social institutions does not predict meeting with bureaucrats, attending community or party meetings, or voting (SI Table F.6). Second, we use these variables to construct a civic participation index. Treated citizens with high levels of civic participation are not more likely to initiate the titling process, and there is no effect on completion (SI Table F.7). Third, trust in a range of formal and informal institutions does not predict demand for titling—with the exception of NGOs—or completion (SI Table F.8). Fourth, if the facilitation hypothesis were correct, participation in social institutions would predict completion, not just demand; yet the opposite pattern emerges (Figure 4 and SI Table D.3). In fact, the horizontal institutions that more clearly represent a cost—contributions to churches and to weddings and funerals—are more predictive of demand than those with a clearer network or insurance function—ROSCAs and mutual aid societies. Finally, among those who initiated the titling process, high participation in social institutions is not predictive of completion, suggesting that such participation did not help them obtain a title (SI Table F.9). Overall, the evidence is more consistent with our argument than with a social capital interpretation.

Disappointment Effects

The crowding-out results might also reflect citizens' disappointment with their chiefs, if they expected chiefs to help obtain a title. Multiple pieces of evidence, however, are inconsistent with this view. First, if crowding-out reflected frustration with chiefs, we would not expect program assignment to reduce participation in horizontal institutions (churches, weddings, ROSCAs) unrelated to chiefs, as it does (Figure 7, top panel). Second, if crowding-out reflected generalized frustration with the hurdles of the titling process, citizens would express frustration not only toward chiefs but also toward the government. However, citizens' evaluations of government performance and corruption remain largely unchanged (SI Table F.10). While column 2 shows a negative effect on government responsiveness, consistent with a frustration interpretation, citizens are less willing to erase a tax code from their door, signaling a greater willingness to become visible to or engage with the state (column 3). Third, disappointment with chiefs for failing to facilitate the titling process would most directly reduce trust in chiefs—yet trust is unaffected at both rounds (SI Table D.8, columns 4 and 6–7). Moreover, while disappointment might explain worse evaluations at Round 1, it would not necessarily predict the reduction in *salongo* participation observed in Round 2. Overall, the results are unlikely to be driven by disappointment effects.

Conclusion

Studying a randomized land titling program in a large Congolese city, this paper examined the interplay between formal land titling and social institutions in urban Africa. We presented novel field-experimental evidence on formal property rights adoption in a low-capacity state. By documenting both high latent demand and significant implementation frictions, this paper illustrated how monetary and transaction costs and social institutions shape citizens' land tenure formalization. Citizens who participate more in horizontal social institutions and who are more closely connected to city chiefs were more—not less—likely to demand a land title. We also find evidence that politically connected chiefs can stifle land titling. Our results suggest a distinctive logic of land formalization in urban areas, where the costs of social extraction exceed the benefits provided by social institutions. These results complement and expand on recent work on titling in rural areas (Honig, 2022). When urban dwellers are offered the opportunity to formalize their land, they may seek to exit the informal equilibrium. We also document negative causal effects of the land titling program on participation in social institutions: treated citizens engage less with social institutions and view their chiefs more negatively.

While we study a formalization program in a specific city, land titling remains a significant challenge in Africa and elsewhere, and the social institutions we examine are present across the developing world (Baldwin & Holzinger, 2019; Bouman, 1983; Lust, 2022). As urbanization accelerates across Africa, cities face formalization bottlenecks. From a policy perspective, the marked increase in take-up induced by the program suggests that carefully designed reforms aimed at simplifying the land titling process and reducing bureaucratic discretion can significantly expand formalization. Beyond the specific Congolese context, our findings suggest a generalizable mechanism: when social institutions are costly and formal alternatives become more accessible, citizens may exit informal arrangements. This has implications for understanding variation in the take-up of formalization interventions in low-capacity settings. While our analysis identifies a distinct logic of land formalization in urban Africa, future work should specify more precisely the scope conditions of our argument.

Finally, our results speak to recent scholarship emphasizing that property regimes both reflect and reshape underlying power relations (Albertus & Klaus, 2025; Levi & Russell, 2025). By showing how citizens recalibrate their institutional choices when formal alternatives emerge, our findings advance our understanding of state-building as a relational process (Migdal, 1988; Wang, 2021), shaped not only by institutional supply but also by citizens' embeddedness in competing arenas of authority (Lust, 2022).

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Ethical Considerations

This study has been approved by the Harvard Institutional Review Board (Protocol IRB17-0724).

Author Contributions

Pablo Balán led the fieldwork, conducted the analysis, and wrote and revised the manuscript. Augustin Bergeron and Gabriel Tourek contributed to fieldwork implementation and data collection. Jonathan Weigel contributed to fieldwork implementation and data collection, provided funding, and facilitated access to the field site.

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Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data Availability Statement

Replication materials and code can be found at Balán et al. (2026).

Pre-Registration

The Pre-Analysis Plan was pre-registered on the AEA RCT Registry (RCT ID: AEARCTR-0002229) and EGAP.

Supplemental Material

Supplemental material for this article is available online.

Notes

1. Replication materials and code can be found at Balán et al. (2026).
2. In 2005, the World Bank supervised a portfolio of more than $1 billion worth of land administration projects (Galiani & Schargrodsky, 2011).
3. The Economist, Sep 12, 2020.
4. For example, Lawry et al. (2017, p. 16) find that the relationship between property rights and agricultural productivity is weaker in sub-Saharan Africa and argue that this “may be based on the fact that most farms in sub-Saharan Africa are held under customary tenure arrangements that provide tenure security.”
5. Because formal land rights can help citizens achieve both higher tenure security and greater autonomy from the state and other actors (Albertus & Klaus, 2025), the literature often conflates the insurance and exit motives.
6. Language reflects this high subjective valuation. During our focus group interviews, citizens often mentioned that the land title with the highest legal weight, known as Certificat d’Enregistrement, is “unattackable”–as it is officially described in Congolese law. See Peyton (2020) for qualitative evidence on the demand for titles in the DRC. Ferree et al. (2023) show that citizens in Malawi value land titles regardless of the authority granting them.
7. The three formally recognized titles are the *Certificat d’Enregistrement* (CE), the *Contrat de Location* (CL), and the *Acte de Vente Notarié* (AVN), listed in decreasing legal weight. Across sub-Saharan Africa, only 2 to 10 percent of land is privately held. Comprehensive land registries and legal markers of land ownership are extremely rare (Boone, 2014; Deininger, 2003).
8. See SI Section B for more details on the history of land titling in the DRC.
9. This figure is from the endline survey. We use control-group respondents to avoid contamination from the treatment.
10. There is some evidence that citizens obtain insurance by participating in religious institutions (Kapepula et al., 2022).

11. These are conservative estimates obtained by winsorizing each measure of expenditure and income by trimming the highest and lowest fifth percentiles. For comparison, the fraction of monthly income spent on transportation–one of the main expenditures of citizens in Kananga–amounts to about 11.4 percent.
12. With the exception of experiencing hunger because of liquidity constraints.
13. The position was formally created in 1972 after a national law abolished traditional authority, seeking to integrate chiefs into the state apparatus (Nzongola-Ntalaja, 1975).
14. The average city chief in Kananga had worked in the position for 10 years, and 19 percent of chiefs inherited the position from a family member.
15. For each treated respondent, we also randomized the magnitude of the subsidy, creating three price levels for each land title. This paper does not exploit the variation induced by the randomized subsidies.
16. In the analysis sample (N = 483), per the eligibility criteria described in SI Section I, all participants hold at least one formal document. In the full baseline sample (N = 4,343), 44 percent of respondents hold at least one pre-existing land document, including colonial-era documents (SI Figure C.1); the most common is the *Acte de Vente (pas notarié)*, held by 19 percent. Only 15 percent hold one of the three state-recognized formal titles (CE, CL, or AVN). Most of these documents are not correlated with tenure insecurity, but the most powerful title, the CE, is negatively correlated with the likelihood of reporting a land dispute, while weaker documents–AVN and CL–are positively correlated (SI Table C.1).
17. Our main results are robust to attrition-weighting and to including controls selected by the double LASSO algorithm (Belloni et al., 2014) (SI Figure I.1). We discuss eligibility and attrition in more detail in SI Section I.
18. See SI Section H for more details on the randomization protocol.
19. This happened for a variety of reasons, including proximity to a ravine, indirect street access, insufficient area, or insufficient construction on the plot. See SI Section I.
20. Two individuals in the control group initiated the titling process (0.87 percent), and one individual in the control group obtained a land title during the study period (0.44 percent). Thus, the treatment effects are large relative to the near-zero control mean.
21. SI Figure G.1 shows the distribution of titles delivered by the program.
22. Since the elements of **Z**i are not randomly assigned, each characteristic is interacted with the treatment indicator. Because these heterogeneity regressions include treatment interactions with baseline covariates, the treatment coefficient in SI Tables D.2-D.5 should not be interpreted as the unconditional ITT, which we report in SI Table D.1.

23. Estimates of property values come from machine learning and computer vision algorithms based on a training set of nearly 2,000 randomly selected properties evaluated by the top expert in the provincial Cadastral Office.
24. SI Tables D.7 and D.8 show treatment effects for each index component.
25. However, the short-term nature of the outcomes does not allow us to systematically study the economic effects of the titling program. This window is shorter than the one used in most studies of land titling. Indeed, investments are unlikely to materialize in a short period. For example, Field (2005) measures investment outcomes one to four years after a titling intervention in Peru, whereas Galiani & Schargrodsky (2010) measure human and physical capital investment between nine and eighteen years after the natural experiment they study. SI Table D.9 shows the effect of the program on additional pre-registered outcomes.
26. While we cannot fully rule out the possibility that these crowding-out effects reflect reduced liquidity, note that (1) these are ITT effects that obtain independent of obtaining a title, and (2) results on social institutions that most clearly entail financial obligations are mixed–with no significant effects on contributions to weddings and funerals.
27. Among insecure respondents with low participation in social institutions, treatment increases demand substantially (T × Insecure = 0.217, $p < 0.05$). Demand for titling could thus reflect demand for insurance among citizens who do not participate in social institutions: those who are insecure but do not bear their cost. That this effect disappears when such insecure citizens participate in social institutions suggests that social institutions may provide them with some insurance (SI Table F.4).

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