

Land, Power, and Property Rights: The Political Economy of Land Titling in West Africa

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MOTIVATION



Figure 1: "Attention land predators! No parcel from this site is meant for sale!"

TITLES ARE AVAILABLE ON-DEMAND

These graffiti suggest that households lack other mechanisms to protect their property rights.

TITLES ARE AVAILABLE ON-DEMAND

These graffiti suggest that households lack other mechanisms to protect their property rights. **But!**



■ Titles available on-demand

41 African countries have made formal land titles available **on demand**: you can apply for a land title if you want one.

WHY CARE ABOUT TITLES?

Formal land titles reduce the risk of households losing their land
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Increased security allows households to make agricultural investments, like using fertilizer or planting trees.

“The délibération changes our behavior because without one, you’re always under threat of land grabs from those with means... You couldn’t plant trees on your parcel if you didn’t have a délibération.”

NEVERTHELESS, TITLING REMAINS RARE

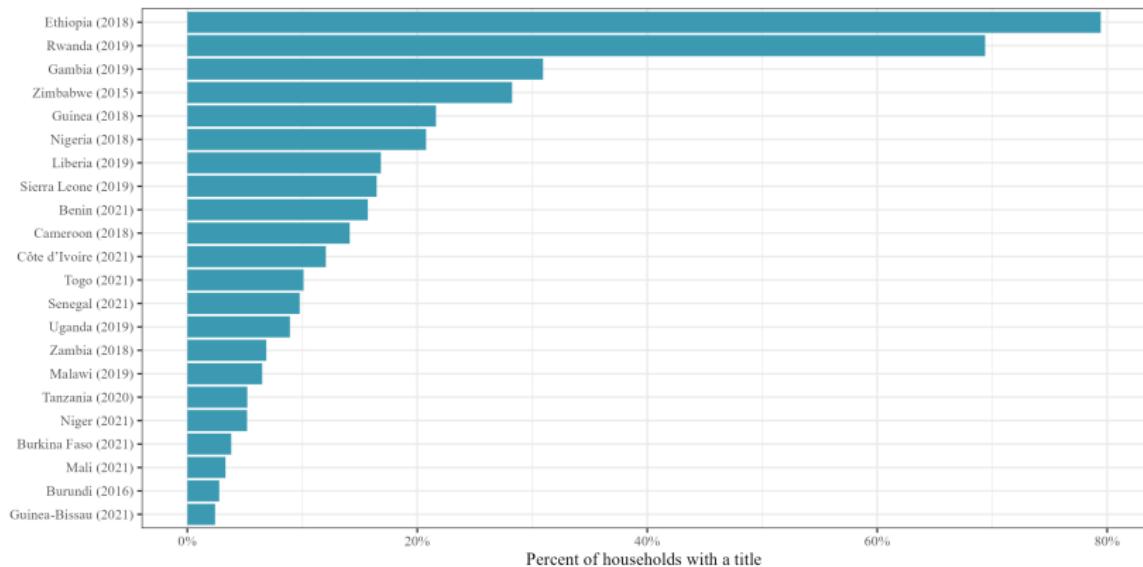


Figure 3: Average titling rates by country

Data from the most recent rounds of LSMS or DHS data collection; all average use survey weights.

THESE GRAFFITI POINT TO AN EMPIRICAL PUZZLE:



Land titles are available on-demand in 41 African countries.

Abundant research shows that households who formalize their property rights benefit relative to households who do not.

Figure 4: "This parcel is not for sale"
(Abidjan, 2024)

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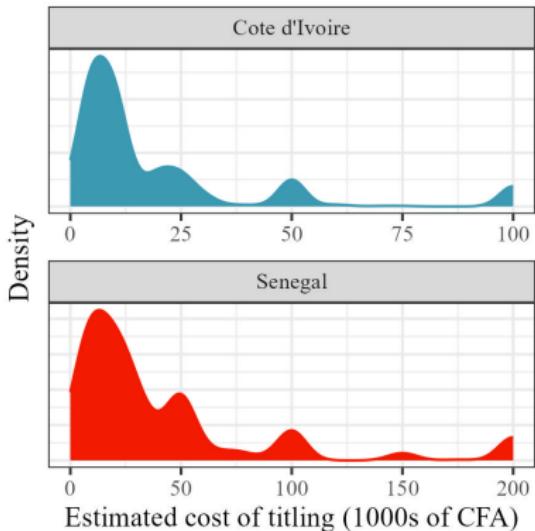
Abundant research shows that households who formalize their property rights benefit relative to households who do not.

Nevertheless, take-up of titles remains low.

Why?

THEORY

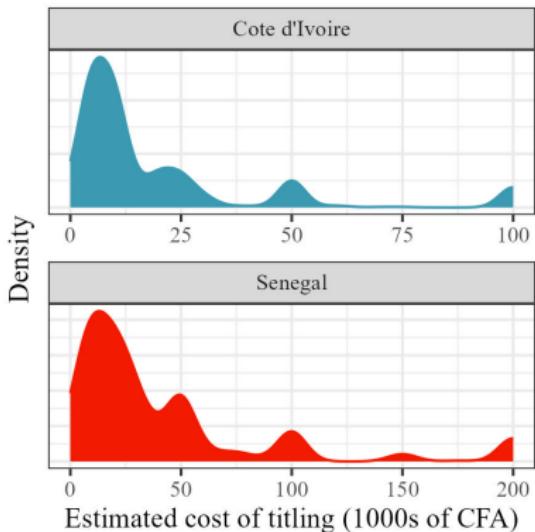
COSTS OF TITLING



Households weigh costs and benefits when deciding whether to pursue formalization.

Figure 5: How much do you think it would cost (in FCFA) to acquire a [land certificate] for one of your parcels?

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Households pay a fee to title. In Senegal, this is 5,000 CFA (about USD 8). In Côte d'Ivoire, this can be several hundred thousand CFA.

Figure 5: How much do you think it would cost (in FCFA) to acquire a [land certificate] for one of your parcels?

COSTS OF TITLING

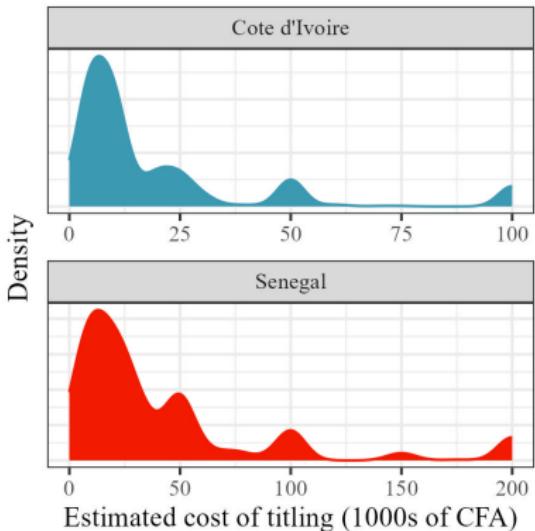


Figure 5: How much do you think it would cost (in FCFA) to acquire a [land certificate] for one of your parcels?

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Land titling is not a 1:1 mapping of existing usage onto paper—there will be winners and losers, and households run a risk of losing land (Boone 2018; Delville and Moalic 2019). Survey evidence

BENEFITS OF TITLING (I)

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- When your property rights are secure, you’re better able to make investments (Besley and Ghatak 2010; Goldstein and Udry 2008; North and Weingast 1989).

BENEFITS OF TITLING (2)

These benefits are increasing in:

- **The value of land:** if your land is more valuable, losing it is costlier, and households have more incentive to title.
- **The returns to agricultural investment:** if titling permits investment, then you have greater incentive to title when the returns to investment are higher.

ROLE OF CHIEFS

When land tenure formalization removes chiefs' power over land, chiefs have an incentive to **impede** households from titling.

- Where land is informal, chiefs resolve land disputes. By bringing land disputes to the chief, households 'bootstrap' the chief's authority (Baldwin and Ricart-Huguet 2023; Firmin-Sellers 1995; Honig 2022).

Where titling decisions are devolved to local institutions, chiefs can capture the process so they will **facilitate** titling.

MODERATING EFFECTS OF CHIEFS AND LAND REGIMES

		Strength of customary chiefs	
		Strong	Weak
National land regime	Devolved	<hr/>	
	Centralized	<hr/>	

Formal hypotheses

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Strength of customary chiefs		
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Formal hypotheses

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National land regime	Devolved	Chiefs facilitate titling	No effect
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Formal hypotheses

MODERATING EFFECTS OF CHIEFS AND LAND REGIMES

		Strength of customary chiefs	
		Strong	Weak
National land regime	Devolved	Chiefs facilitate titling	No effect
	Centralized	Chiefs impede titling	No effect

Formal hypotheses

DATA AND METHODS

FOUR SOURCES OF DATA:

- **Outcome variable:** LSMS and DHS survey, aggregated from 60 different survey waves across 22 countries. Specific variable is a binary indicator for whether a household has at least one land title.
- **Explanatory variable:** new approach to measuring land values, combining geospatial data on attainable yields and global commodity price data.
- **Moderators:**
 - Georeferenced data from Murdock's ethnographic atlas captures the local strength of customary institutions
 - Country-level indicator for centralized or devolved land tenure institutions.

OUTCOME DATA

I combine two large scale data collection efforts: the Demographic and Health Surveys (DHS) and the Living Standards Measurement Surveys (LSMS).

- 22 countries;
- 60 country-survey wave dyads;
- 389,529 survey observations;
- 170,216 observations with non-missing observations of land titling.

Outcome variable: whether a household has at least one formal land title.

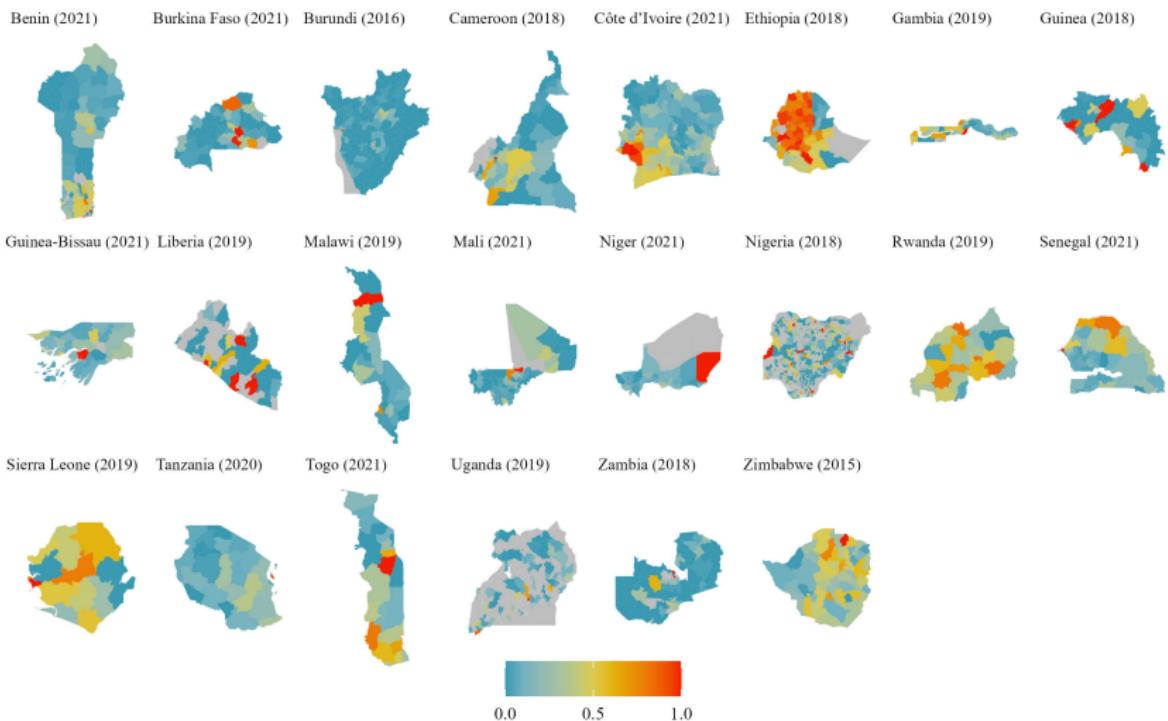


Figure 6: Fraction of landholding households with at least one formal land title

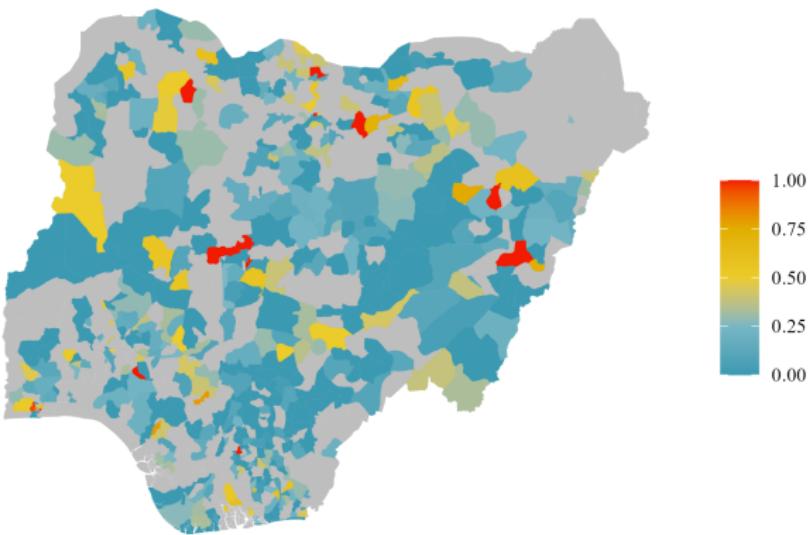


Figure 7: Fraction of landholding households in Nigeria with at least one formal land title

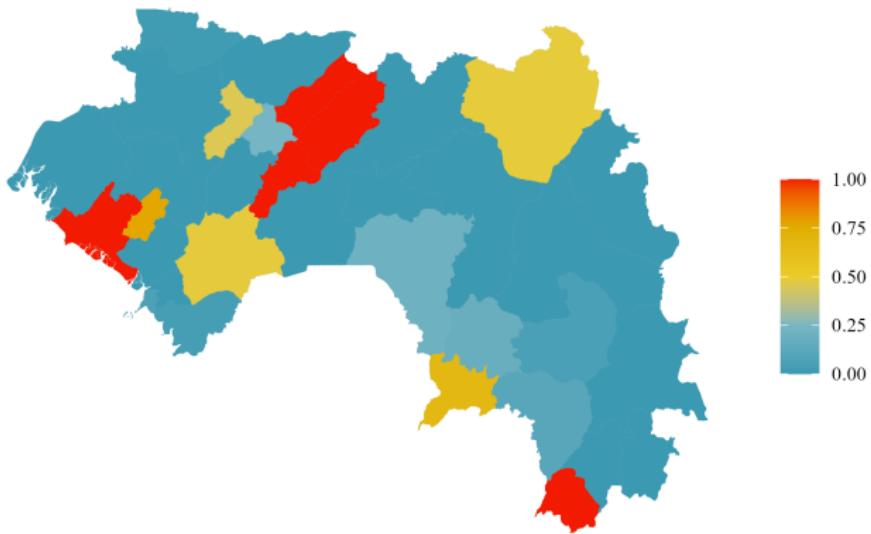


Figure 7: Fraction of landholding households in Guinea with at least one formal land title



Figure 7: Fraction of landholding households in Senegal with at least one formal land title

LAND VALUES

How to measure land values in areas without well-documented land markets?

- Crop-wise total attainable yield per hectare from the Food and Agricultural Organization (FAO)'s Global Agro-Ecological Zones (GAEZ) dataset.
- Historic commodity price details from the IMF's Primary Commodity Price System.

For each crop and grid cell, I multiply the maximum attainable yield (MT/ha) by the commodity prices in a given year (USD/MT) to obtain the attainable price (USD/ha). I then take the maximum of this vector.

Formal definition

RETURNS TO INVESTMENT

In addition to the maximum attainable value, I can adjust the underlying parameters of the model to obtain two estimates of the returns to investing in the land:

- The difference in attainable value with and without fertilizer (i.e. the returns to fertilization)
- The difference in attainable value planting tree crops and other crops (i.e. the returns to planting trees)

RETURNS TO INVESTMENT

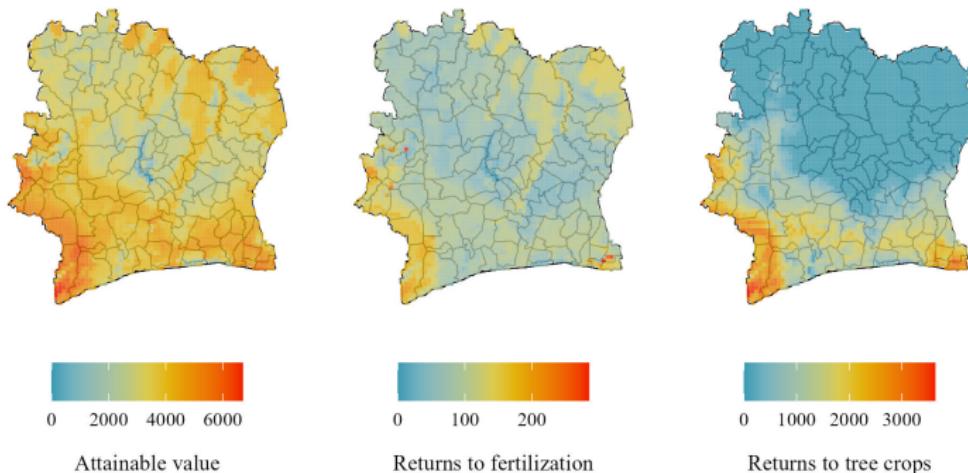


Figure 8: Land value measures in Côte d'Ivoire (2018)

THE STRENGTH OF CUSTOMARY INSTITUTIONS

I interact these land value data with a measure of hierarchy in local precolonial institutions from Murdock's ethnographic atlas.

This is a metric for the **strength of customary institutions**.

Distribution of hierarchy

Justification

LAND TENURE REGIMES

I classify a land regime as devolved if decisions about whether a household can title a given parcel are made at the national level (**centralized**) or another level (**devolved**).

I code based on where decisions are made, not where papers are signed.

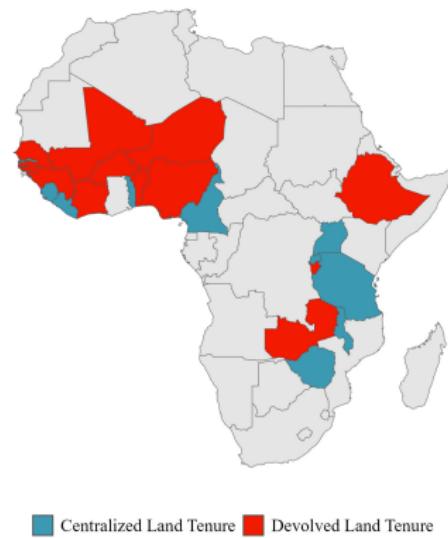


Figure 9: Devolved and centralized land tenure regimes

DESIGN

I estimate a series of triple interaction models using the the following:

- **Outcome variable:** Binary indicator for whether a household has at least one land title.
- **Explanatory variables:** Attainable value per hectare, returns to agricultural investment.
- **Moderating variables:** Strength of customary institutions and whether the country has devolved its land tenure formalization program.
- Plus a vector of demographic and geographic control variables.

Control variables

Equations

RESULTS

MARGINAL EFFECTS OF LAND VALUES ON TITLING

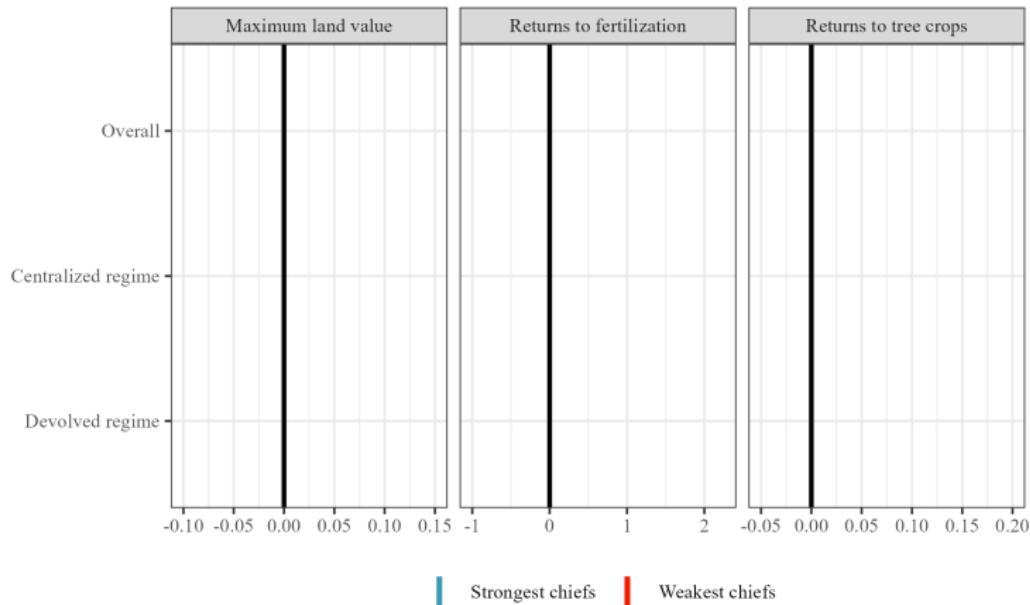


Figure 10: Heterogenous effects of a 1,000 USD increase in land value and returns to agricultural investments

MARGINAL EFFECTS OF LAND VALUES ON TITLING

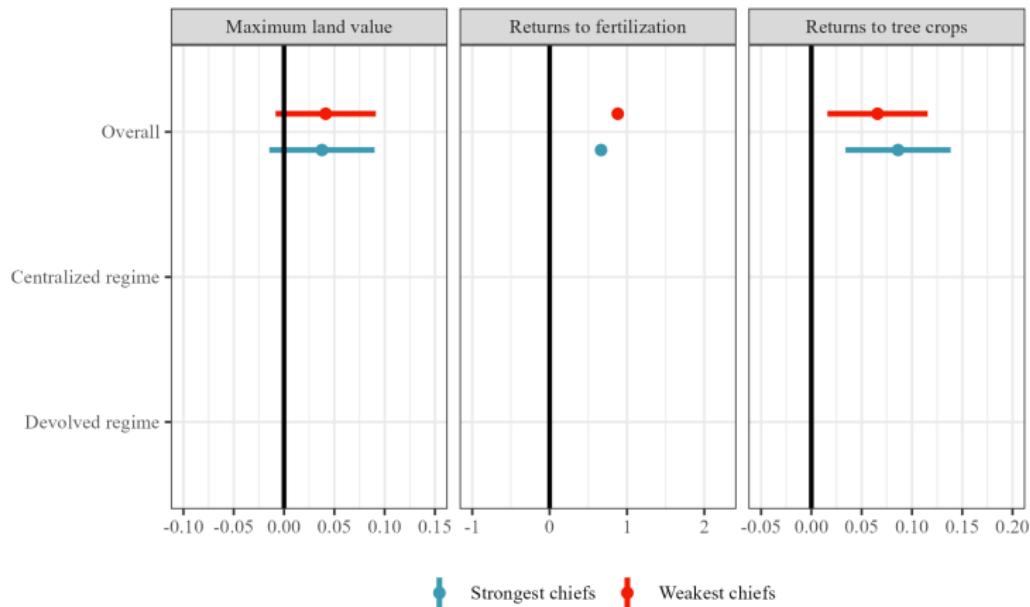


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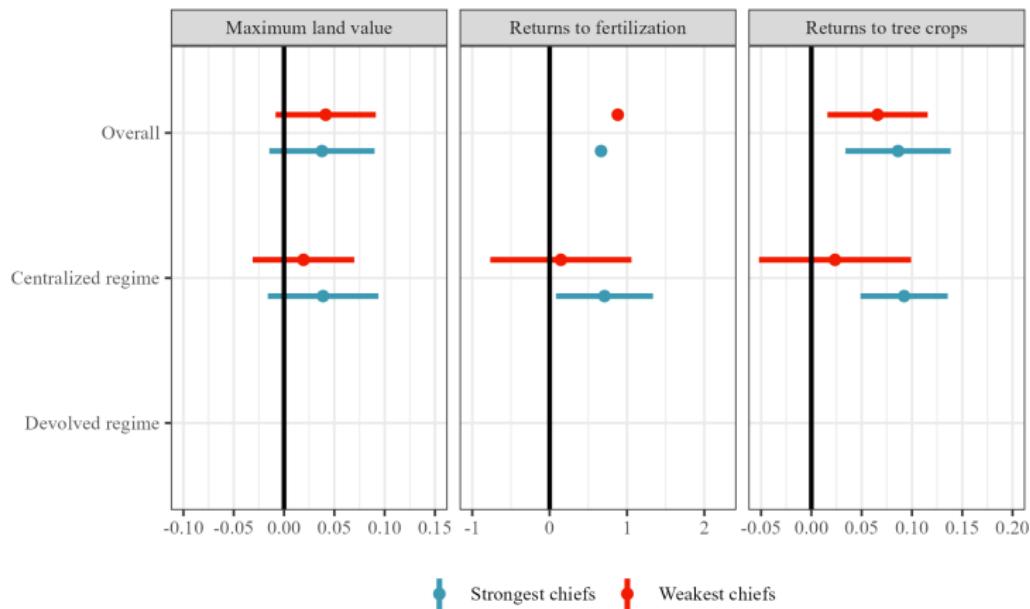


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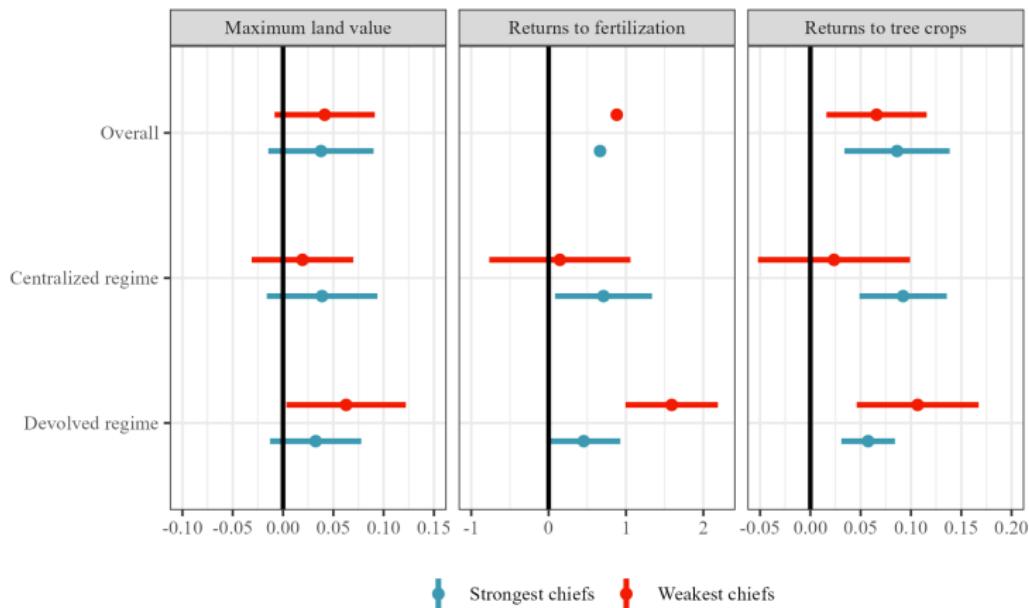


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MARGINAL EFFECTS OF LAND VALUES

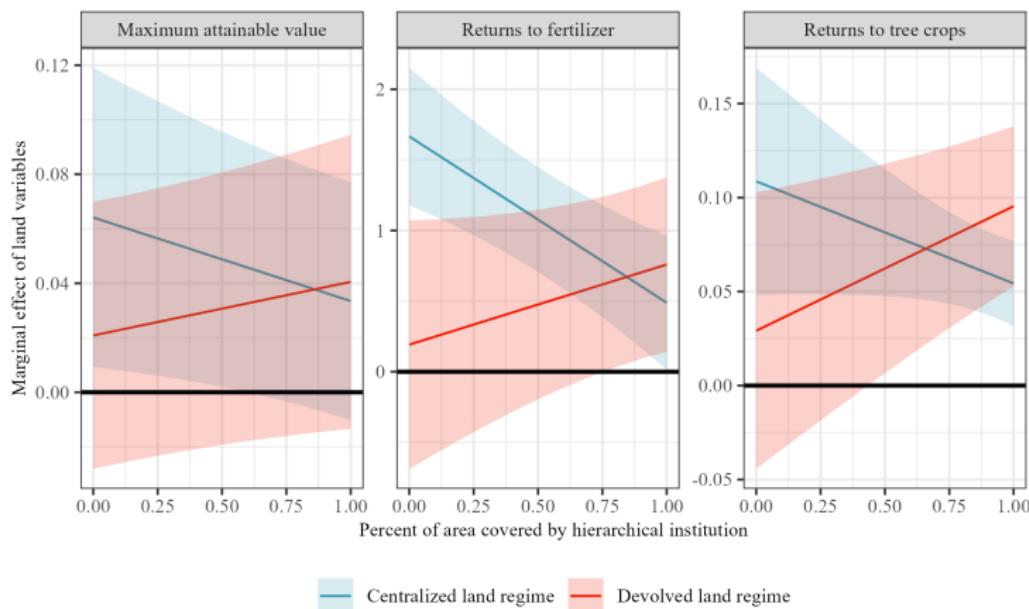


Figure II: Marginal effects of a 1,000 USD increase in land value and returns to agricultural investments

ROBUSTNESS CHECKS

Results are robust to:

- Dropping Ethiopia and Rwanda (the two countries with top-down titling programs). [Marginal effects plot](#)
- Log-transforming land values and the returns to agricultural investment. [Marginal effects plot](#)
- Restricting to only the most recent survey waves (although the standard errors are larger due to the smaller sample size).
[Marginal effects plot](#)
- Dropping individual countries

ALTERNATIVE EXPLANATIONS

- Does household wealth drive titling?
 - If land values -> wealth -> titling, then households should title their dwellings as well
 - I use titles for dwellings as a placebo outcome Regression table
Marginal effects plot
- Do more educated households title?
 - Yes... but not enough to explain the variation
Standardized mean differences
- Is this driven by colonial history?
 - Conventional narrative is that chiefs were more powerful in British colonies.
 - Results are largely identical across colonizer: Regression table

CONCLUSION

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This research investigates an empirical puzzle in comparative politics:

1. Households who title their landholdings benefit.
2. Titles are broadly available.
3. Nevertheless, titles remain rare.

RESULTS

- I show that households whose land is more valuable or who would benefit more from agricultural investments are more likely to possess a land title.
- However, customary chiefs also play a major role.
 - Where land tenure administration is devolved, strong chiefs **facilitate** land titling.
 - Where land tenure administration is centralized, strong chiefs **impede** land titling.

CONTRIBUTION

- I document extensive and granular variation in the uptake of rural property rights.
- This research tests an important theory in political economy: increased land values lead households to seek formal property rights (Besley and Ghatak 2010; Herbst 2014; Libecap 1989; North 1990).
- Most previous research explores when states and elites supply property rights, but this variation requires a pivot to explore when households demand property rights (Albertus 2020; Boone 2014; Onoma 2010).
- I also outline the circumstances under which chiefs add value to development efforts (Baldwin 2016; Baldwin and Ricart-Huguet 2023; Henn 2023).



Thank you for listening!

COSTS OF TITLING (2)

- In Sénégal, **32 percent** of respondents worried that they “might lose access to some of [their] land during the formalization process” and **five percent** knew somebody who lost land while attempting to formalize it.
- In Côte d’Ivoire, **36 percent** of respondents worried that they “might lose access to some of [their] land during the formalization process” and **nine percent** knew somebody who lost land while attempting to formalize it.

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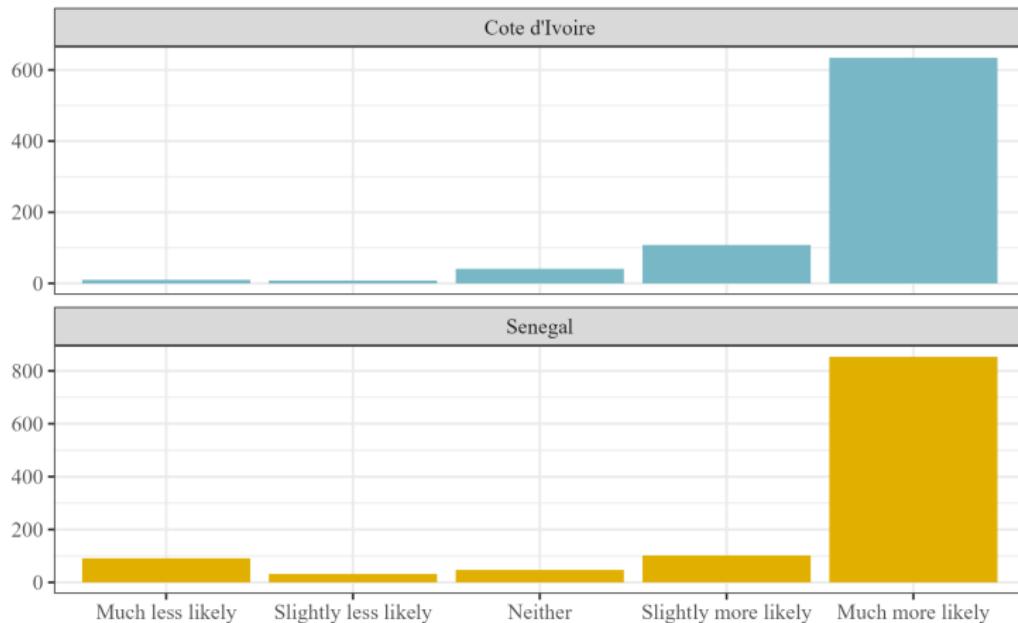


Figure 12: Do you think somebody with a certificat foncier would be more likely to succeed in a land dispute? [Back](#)

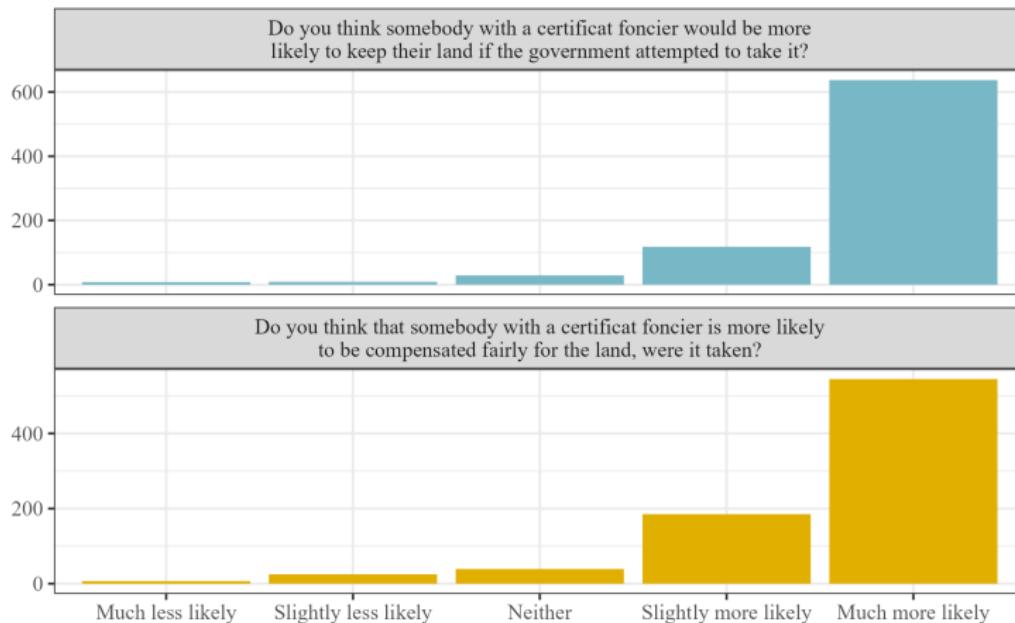


Figure 13: Is a title helpful against the government? Responses from Côte d'Ivoire

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FORMAL HYPOTHESES

- H.1 Households in areas where the value of land is higher will be more likely to possess a title.
- H.2 Households in areas where the returns to agricultural investment are higher will be more likely to possess a title.
- H.3 Strong customary institutions will attenuate the relationship between land values/returns to titling in countries where land tenure formalization is centralized.
- H.4 Strong customary institutions will strengthen the relationship between land values/returns to titling in countries where land tenure formalization is devolved.

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SOURCES FOR OUTCOME DATA

Data are from the most recent round of the Demographic and Health (DHS) or Living Standards Measurement Survey (LSMS). All averages use provided survey weights.

Data for Benin, Burundi, Cameroon, Gambia, Guinea, Liberia, Mali, Nigeria, Rwanda, Senegal, Sierra Leone, Zambia, and Zimbabwe are from the DHS.

Data for Burkina Faso, Cote d'Ivoire, Ethiopia, Guinea-Bissau, Malawi, Niger, Tanzania, and Uganda and from the LSMS.

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TITLING RATES OVER TIME



Figure 14: Fraction of landholding households with at least one formal land title per country over time [Back](#)

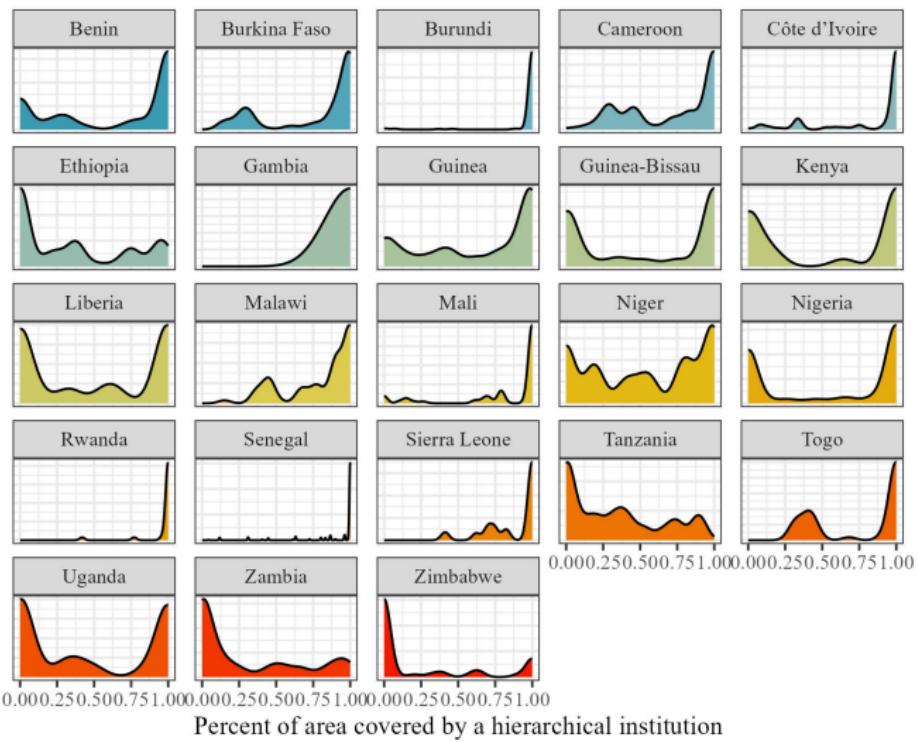
FORMAL DEFINITION

More formally, the value π_g of grid cell g in year y is defined as:

$$\pi_{g,y} = \max_c (p_{c,y} \cdot s_{c,y,g})$$

where p indicates crop price, s indicates the attainable yield, and observations are indexed by g for grid cell, y for year, and c for crop. These data will measure the maximum attainable value in dollars per hectare for a given 10km by 10km grid cell on a yearly basis.

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Figure 15: Distribution of hierarchy variables by country

Data are from the Murdock ethnographic atlas.

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DOES MURDOCK CAPTURE THE STRENGTH OF INSTITUTIONS?

The Murdock data have some error, but existing literature suggests that, on average, stronger precolonial institutions lead to stronger contemporary institutions.

- The Murdock-specific measure is associated with contemporary social outcomes (Bahrami-Rad, Becker, and Henrich 2021; Neupert-Wentz and Müller-Crepion 2024; Nunn 2008).
- Qualitative measures of precolonial institutions also show their impact on contemporary outcomes (Honig 2022; Wilfahrt 2022).

Measurement error on the right hand side of my equation should bias my estimates towards zero: using Murdock data attenuates my results.

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EQUATIONS

I'll model this using a series of triple-interactions:

$$\gamma_{idnw} = \beta_1 V_d + \beta_2 H_d + \beta_3 V_d \cdot H_d + \beta_4 H_d \cdot C_n + \beta_5 V_d \cdot H_d \cdot C_n + X_i + Z_d + \psi_{nw}$$

- **V** indicates the land value variable;
- **H** represents the fraction of the area covered by hierarchical precolonial institutions; and
- **C** is a binary indicator for whether the country devolved its land administration.

X and Z are vectors of household-level and district level controls (respectively), i indexes observations by individual, d by district, n by country, and w by survey wave. [Back](#)

CONTROL VARIABLES

Demographic controls:

- Household head education
- Household head sex
- Household head age (and age²)
- Binary for urban

Geographic controls averaged by 2nd level admin divisions:

- Area
- Population density
- Area * population density
- Terrain ruggedness
- Distance to the capital
- Caloric suitability

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Table 1: Strong customary institutions moderate the relationship between land value and the uptake of land titles

	(1)	(2)	(3)	(4)	(5)	(6)
Land value	0.032 (0.025)		0.033 (0.025)	0.037 (0.024)	0.043** (0.015)	0.065* (0.026)
Hierarchy		0.002 (0.030)	0.003 (0.030)	-0.076* (0.036)	0.003 (0.029)	0.040 (0.075)
Hierarchy * Devolved				0.117** (0.041)		-0.049 (0.089)
Land value * Hierarchy						-0.030 (0.026)
Land value * Devolved					-0.013 (0.024)	-0.043 (0.034)
Land value * Hierarchy * Devolved						0.049 (0.030)
Country-Wave Fixed Effects	X	X	X	X	X	X
Demographic Controls	X	X	X	X	X	X
Geographic Controls	X	X	X	X	X	X
Num.Obs.	156 819	156 819	156 819	156 819	156 819	156 819
R ₂	0.252	0.251	0.252	0.254	0.252	0.255

Note: The dependent variable of this model is a binary indicator for whether a household possesses a land title. The independent variables are the maximum attainable value; the fraction of an administrative unit that is covered by a hierarchical pre-colonial institution; and a binary indicator for whether the country has devolved its land regime to local authorities. The unit of analysis is the household. Land value data vary at the second level administrative division, with the exception of Côte d'Ivoire (third level) and Malawi (first level). Demographic controls include the age, sex, and education of the household head; geographic controls include area, population density, an urban/rural indicator, and terrain ruggedness. Data are from the DHS and LSMS projects. All regressions use OLS with survey weights and country-wave fixed effects. Standard errors are clustered at the country-wave level.

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Table 2: Strong customary institutions moderate the relationship between returns to fertilizer and the uptake of land titles

	(1)	(2)	(3)	(4)	(5)	(6)
Difference (fertilizer)	0.816*** (0.243)		0.819*** (0.227)	0.886*** (0.234)	1.056*** (0.249)	1.620*** (0.389)
Hierarchy		0.002 (0.030)	0.003 (0.029)	-0.077* (0.031)	0.003 (0.028)	0.060 (0.053)
Hierarchy * Devolved				0.119** (0.038)		-0.057 (0.066)
Difference (fertilizer) * Hierarchy						-1.114* (0.503)
Difference (fertilizer) * Devolved					-0.438 (0.543)	-1.419 (0.787)
Difference (fertilizer) * Hierarchy * Devolved						1.662* (0.698)
Country-Wave Fixed Effects	X	X	X	X	X	X
Demographic Controls	X	X	X	X	X	X
Geographic Controls	X	X	X	X	X	X
Num.Obs.	156 819	156 819	156 819	156 819	156 819	156 819
R ²	0.252	0.251	0.252	0.255	0.253	0.256

Note: The dependent variable of this model is a binary indicator for whether a household possesses a land title. The independent variables are the increase in maximum attainable value from fertilizing a parcel; the fraction of an administrative unit that is covered by a hierarchical pre-colonial institution; and whether the country has devolved its land regime to local authorities. The unit of analysis is the household. Land value data vary at the second level administrative division, with the exception of Côte d'Ivoire (third level) and Malawi (first level). Demographic controls include the age, sex, and education of the household head; geographic controls include area, population density, an urban/rural indicator, and terrain ruggedness. Data are from the DHS and LSMS projects. All regressions use OLS with survey weights and country-wave fixed effects.

Standard errors are clustered at the country-wave level. [Back](#)

Table 3: Strong customary institutions moderate the relationship between returns to planting tree crops and the uptake of land titles

	(1)	(2)	(3)	(4)	(5)	(6)
Difference (trees)	0.078*** (0.012)		0.079*** (0.013)	0.077*** (0.016)	0.093*** (0.022)	0.106*** (0.030)
Hierarchy		0.002 (0.030)	0.007 (0.029)	-0.068* (0.033)	0.007 (0.028)	-0.052 (0.034)
Hierarchy * Devolved				0.110** (0.037)		0.081* (0.040)
Difference (trees) * Hierarchy						-0.050** (0.018)
Difference (trees) * Devolved					-0.018 (0.028)	-0.079* (0.031)
Difference (trees) * Hierarchy * Devolved						0.113*** (0.030)
Country-Wave Fixed Effects	X	X	X	X	X	X
Demographic Controls	X	X	X	X	X	X
Geographic Controls	X	X	X	X	X	X
Num.Obs.	156 819	156 819	156 819	156 819	156 819	156 819
R ²	0.255	0.251	0.255	0.257	0.255	0.258

Note: The dependent variable of this model is a binary indicator for whether a household possesses a land title. The independent variables are the difference in maximum attainable value between planting tree crops and planting other crops; the fraction of an administrative unit that is covered by a hierarchical pre-colonial institution; and whether the country has devolved its land regime to local authorities. The unit of analysis is the household. Land value data vary at the second level administrative division, with the exception of Côte d'Ivoire (third level) and Malawi (first level). Demographic controls include the age, sex, and education of the household head; geographic controls include area, population density, an urban/rural indicator, and terrain ruggedness. Data are from the DHS and LSMS projects. All regressions use OLS with survey weights and country-wave fixed effects. Standard errors are clustered at the country-wave level.

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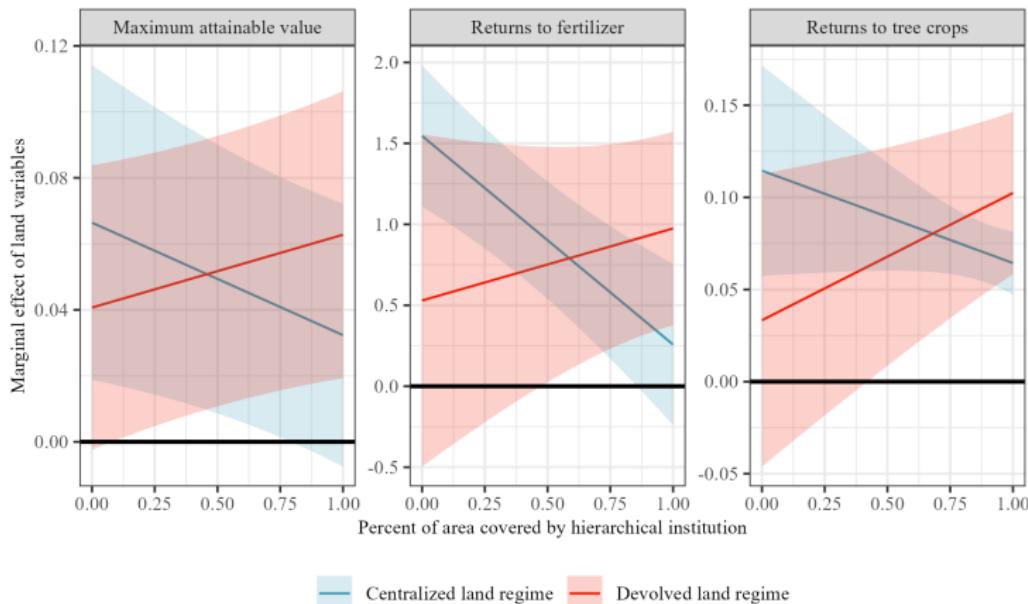


Figure 16: Marginal effects of a 1,000 USD increase in land value and returns to agricultural investments, excluding Ethiopia and Rwanda [Back](#)

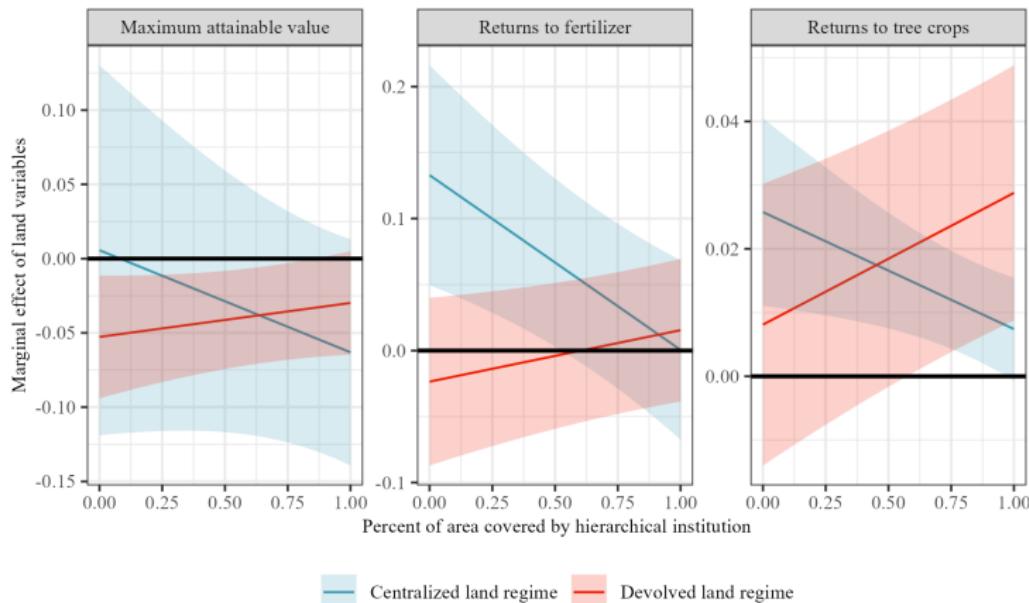


Figure 17: Marginal effects of a one percent increase in land value and returns to agricultural investments (logged independent variables) [Back](#)

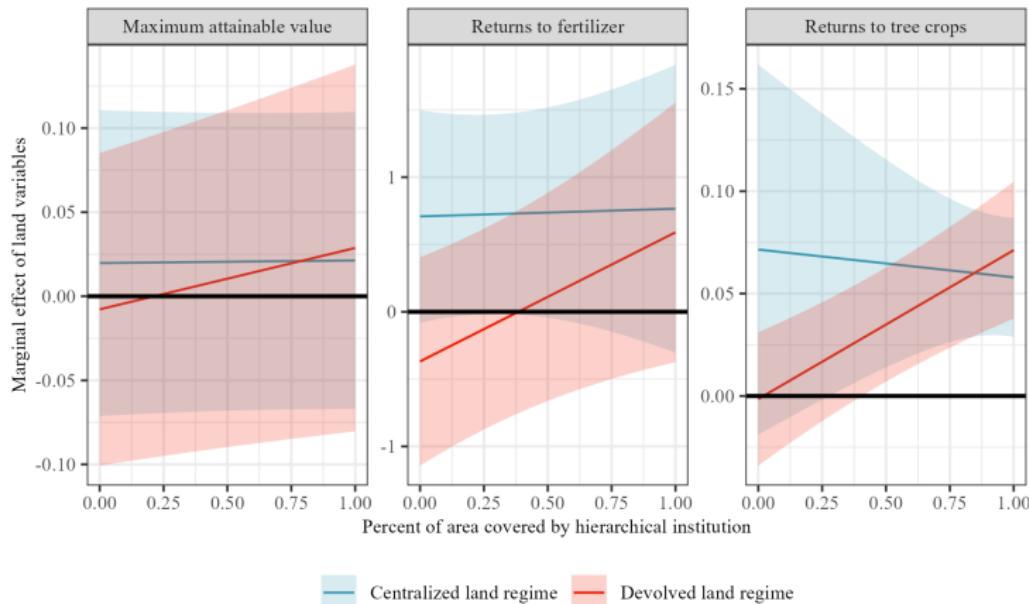


Figure 18: Marginal effects of a one percent increase in land value and returns to agricultural investments (logged independent variables) [Back](#)

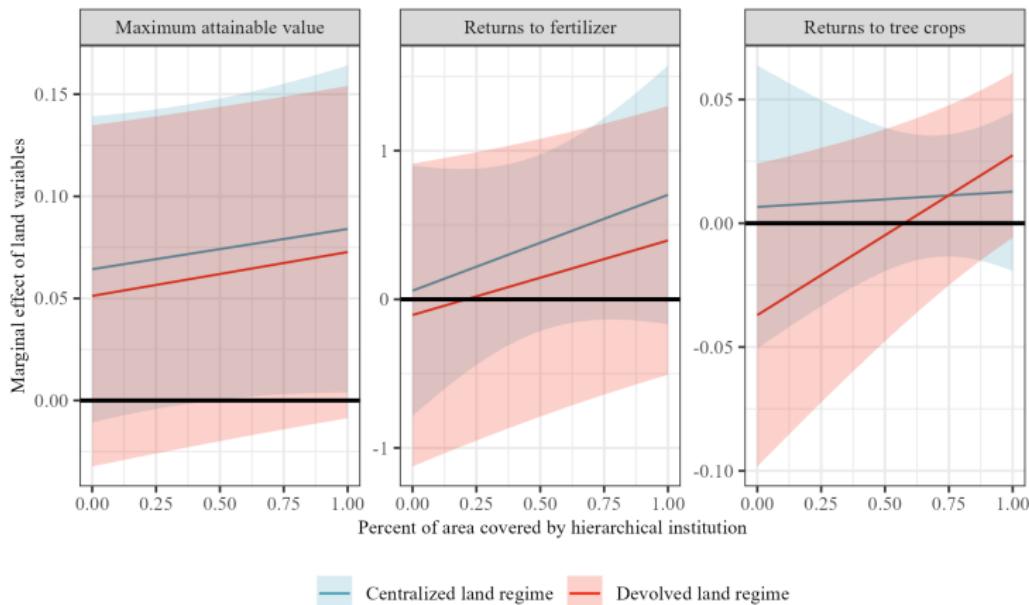


Figure 19: Marginal effects of a 1,000 USD increase in land value and returns to agricultural investments [Back](#)

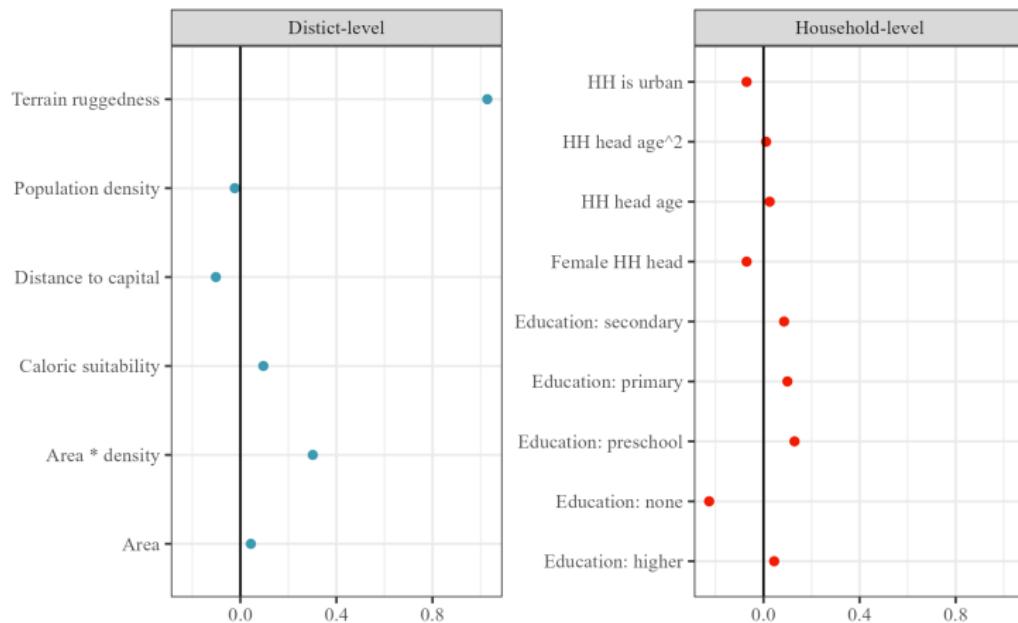


Figure 20: Standardized mean differences between households with and without titles

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Table 4: Land values do not affect titling for dwellings

	(1)	(2)	(3)	(4)	(5)	(6)
Max value	0.010 (0.015)	-0.004 (0.015)				
Difference (fertilizer)			0.064 (0.404)	-0.172 (0.377)		
Difference (trees)					0.025 (0.032)	0.001 (0.029)
Max value * Hierarchy	0.006 (0.021)	0.019 (0.021)				
Difference (fertilizer) * Hierarchy			0.323 (0.552)	0.585 (0.539)		
Difference (trees) * Hierarchy					0.011 (0.034)	0.006 (0.033)
Max value * Hierarchy * Devolved	-0.008 (0.025)	-0.002 (0.025)				
Difference (fertilizer) * Hierarchy * Devolved			-0.344 (0.652)	-0.120 (0.652)		
Difference (trees) * Hierarchy * Devolved					-0.007 (0.037)	0.055 (0.042)
Country-Wave Fixed Effects	X	X	X	X	X	X
Demographic and Demographic Controls		X		X		X
Geographic Controls		X		X		X
Num.Obs.	254 772	228 732	254 772	228 732	254 772	228 732
R ²	0.070	0.104	0.069	0.104	0.070	0.104

The dependent variable of these models is a binary indicator for whether a household possesses a title for their dwelling. The independent variables are three metrics of land value (maximum attainable value, the returns to using fertilizer, and the returns to planting tree crops); the fraction of an administrative unit that is covered by a hierarchical pre-colonial institution; and whether the country has devolved its land regime to local authorities. The unit of analysis is the household. All regressions use OLS with survey weights and country-wave fixed effects. Standard errors are clustered at the country-wave level.

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Table 5: Estimates are similar in British former colonies and other countries

	Former British colonies			All other countries		
	(1)	(2)	(3)	(4)	(5)	(6)
Max value	0.055*			0.010		
	(0.024)			(0.049)		
Difference (fertilizer)		1.720***			0.115	
		(0.194)			(0.947)	
Difference (trees)			0.097*			0.121***
			(0.035)			(0.030)
Max value * Devolved	-0.026			0.013		
	(0.015)			(0.039)		
Difference (fertilizer) * Devolved		-1.009**			0.002	
		(0.333)			(0.955)	
Difference (trees) * Devolved			-0.220***			-0.072
			(0.038)			(0.050)
Max value * Hierarchy * Devolved	0.024			-0.033		
	(0.014)			(0.040)		
Difference (fertilizer) * Hierarchy * Devolved		1.083**			-0.690	
		(0.301)			(0.951)	
Difference (trees) * Hierarchy * Devolved			0.185***			0.138***
			(0.041)			(0.030)
Country-Wave Fixed Effects	X	X	X	X	X	X
Demographic + Demographic Controls	X	X	X	X	X	X
Num.Obs.	49 177	49 177	49 177	107 645	107 645	107 645
R ²	0.068	0.072	0.067	0.339	0.339	0.344

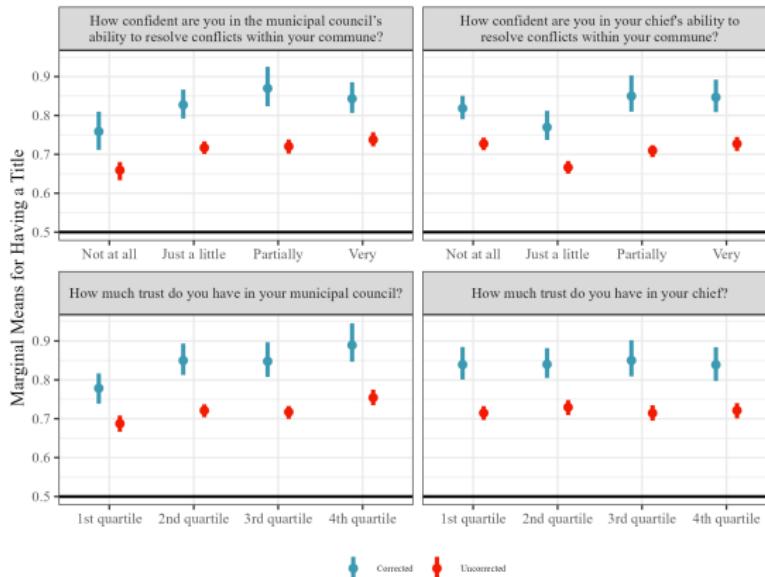
The dependent variable of these models is a binary indicator for whether a household possesses a title for at least one agricultural parcel. The independent variables are three metrics of land value (maximum attainable value, the returns to using fertilizer, and the returns to planting tree crops); the fraction of an administrative unit that is covered by a hierarchical pre-colonial institution; and whether the country has devolved its land regime to local authorities. All regressions use OLS with survey weights and country-wave fixed effects.

Standard errors are clustered at the country-wave level.

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RESULTS

Figure 21: Confidence in municipal councils increases the weight respondents place on formal land titles



Bars represent 95 percent confidence intervals, calculated using a block bootstrap. For the "how much trust do you have in" questions, I subtract the average of all other "trust" questions, then take the quartiles. [Back](#)