Nigeria Agricultural Policy Project

SCRUTINIZING THE STATUS QUO: RURAL TRANSFORMATION AND LAND TENURE SECURITY IN NIGERIA

By

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ABSTRACT

Despite growing consensus on the socio-economic benefits emanating from enhanced land tenure security, issues related to how best to measure it and what constitute universal indicators of tenure (in)security are poorly understood. As a result, issues of what drives tenure security are poorly understood and inconclusive. This study, thus, examines the drivers of perceived tenure insecurity in Nigeria using the Nigeria LSMS-Panel General Household Survey of 2012/13. The determinants of perceive tenure insecurity are assessed across two indicators: private (idiosyncratic) tenure risk and collective (covariate) tenure security risk. The analysis shows that perceived risks of private land dispute are higher for female-headed households, households with lower social/political connectedness, and for land parcels acquired via the traditional/customary system, in contrast to having been purchased. Private tenure risk/insecurity is also higher in communities with vibrant land market and for households that are located close to urban centers, while the opposite is the case in communities with relative ease of land access. On the other hand, collective tenure risk is lower in communities with improved economic status. Finally, signifying the need to account for intra-household dimensions in implementing land reform interventions, results from a more disaggregated analysis show that tenure security is relatively higher on female-managed plots of female-headed households, while the opposite is the case for female-managed plots of male-headed households.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. BACKGROUND

Land is a major means of livelihood for a large portion of the population in Africa, with agriculture constituting the highest sectoral share of GDP and employment for most countries (Cotula et al. 2004). Over the last decade or so, land tenure reform and enhanced tenure security have been given due attention by governments of many African countries as policy tools to bring about agricultural growth and to alleviate poverty (Place 2009).

Conceptually, tenure security is assumed to stimulate agricultural investment and, hence, foster increased agricultural productivity (Besley 1995). Despite growing consensus on the social and economic need for enhancing tenure security, there is no such consensus among researchers as to how it should be measured and what constitute robust indicators of tenure security. As a result, issues of what drives tenure security are poorly understood and the available empirical evidence remains inconclusive (Durand-Lasserve and Selod 2009). (A few exceptions include Ghebru 2015; Ayamga et al. 2015; Linkow 2016, Ghebru et al. 2016a; and Ghebru et al. 2016b.)

This is mainly because of the dichotomy in understanding tenure security as either a perception of (or de facto) tenure security versus de jure tenure security which is legally conferred and recognized. Fernandes (2002) and Durand-Lasserve (2005) note the importance of perceptions of tenure security in prompting many of the actions that formal title is meant to ensure, such as access to credit and investment. Tenure arrangements in informal delivery systems can guarantee a reasonably good level of security, even when these tenure arrangements are not formally recognized by the state. Recognition by the community itself and by the neighborhood is often considered more important than recognition by public authorities for ensuring secure tenure (Durand-Lasserve 2005; Cousins et al. 2001). Following such arguments, there is now a global effort in using people's perceptions as a proxy for measuring tenure security as well as a way of tracking and monitoring efforts being made to enhance tenure security. A notable initiative towards such an approach in measuring tenure security is the Sustainable Development Goals (SDGs) indicators on land governance – SDG indicator 1.4.2[1].

This study aims to better understand the factors that drive tenure insecurity of households using a nationally representative household survey for Nigeria, the 2012/13 Nigeria LSMS survey. Such analysis is timely for a country that has recently made significant strides to reform the land governance sector. The determinants of perceived tenure insecurity are examined using two proxies of tenure insecurity: perceived risk of private land dispute (private tenure risk) and perceived risk of land expropriation by the government (collective tenure risk).

The empirical findings show that factors that increase the probability of private tenure risk may not necessarily have a similar effect when it comes to collective tenure risk. The results show that the probability of private land dispute is higher for female-headed households, whereas the probability of land expropriation by the government is lower for households who have social or political connection with community chiefs. A more disaggregated analysis shows that tenure security is relatively higher on female-managed plots of female-headed households, while the opposite is the case for female-managed plots of male-headed households.

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[1] According to the latest metadata released by the custodians of SDG indicator 1.4.2 (World Bank and UN-Habitat 2017), the indicator is defined as "Proportion of total adult population with secure tenure rights to land, with legally recognized documentation, and who perceive their rights to land as secure, by sex and by type of tenure."

Perceived tenure insecurity of private nature is higher for households who are close to urban centers. At community-level, perceived risk of private land dispute is higher in communities where the land market is more vibrant. On the other hand, perceived risk of land expropriation by the government is lower in communities with an improved economic situation. Moreover, reinforcing the growing consensus about how property rights under traditional/customary tenure systems are proving to be weaker due to social (migration, urbanization) and economic (commercialization and land commodification) transformations, a key finding of this study is that parcels acquired by households via the traditional institutions show a higher risk of tenure insecurity (both private and public in nature) as compared to parcels that were purchased.

The rest of the paper is organized as follows. Section two discusses the conceptual framework of the drivers of tenure insecurity. A review of recent land reform and tenure security in Nigeria is presented in the third section. The fourth section is devoted to a discussion of the data used and the methodology of the study. The fifth and sixth sections present a discussion of the results obtained from descriptive and econometric analysis, respectively. Finally, a summary of major findings and concluding remarks are presented.

2.   CONCEPTUAL FRAMEWORK

Land tenure security is positively linked to agricultural investment incentives, which in turn lead to increases in agricultural productivity (Besley 1995). Tenure security is assumed to increase agricultural investment through three different channels. First, it promotes long term investment in land by reducing expropriation risk (Feder and Feeny 1991; Besley 1995). Second, it encourages investment by lowering transaction costs and allowing more productive farmers to purchase or rent land from less productive farmers, making both parties better off (Lanjouw and Levy 2002; Besley 1995). Third, it increases access to investment funds by reducing asymmetric information about land ownership rights and allowing individuals to use their land as collateral for loans (De Soto 2000; Carter and Olinto; 2003; Besley 1995). However, the findings of studies on the impact of tenure security on agricultural investment show mixed results – some studies show positive relationship between tenure security and agricultural investment (Kabubo-Mariara 2009; Smith 2004; Benin et al. 2005; Holden et al., Deininger & Ghebru 2011), whereas others indicate no significant relationship (Brasselle et al. 2002; Holden and Yohannes 2002).

The empirical evidence on the link between land tenure security and agricultural investment and productivity differ based on differences in the context of the studies and measurements of tenure security (Persha et al. 2015; Arnot et al., Luckert & Boxall 2011). There is no consensus on the definition and measurement of tenure security in recent studies which looked at issues related to tenure security. Some studies use documentation and registration of land rights as a measure of tenure security (Besley 1995; Place and Otsuka 2001; Brasselle et al. 2002; Fenske 2011), while other use a self-reported indicator – the farmers' perception regarding the likelihood of losing land (Holden and Yohannes 2002; Hagos and Holden 2006; Ghebru et al. 2016a).

This study argues that decisions by farmers on agricultural investments to enhance long term agricultural production rest significantly on expectations regarding the length of time in which the benefits will be realized. These expectations mainly depend on farmers' sense of tenure security, which could be influenced by two potential sources, namely: i) risk of losing land ownership or use right due to dispute/eviction by individuals - hereafter called private tenure risk; or ii) due to expropriation by the government – hereafter called collective tenure risk (Ghebru 2015). The perception of households regarding tenure security is assumed to be

influenced by three main elements: formalization and individualization of land rights; commodification or commercialization of land; or economic and demographic changes in rural areas (Ghebru et al. 2016a). Hence, the factors that determine perceived tenure (in)security might have distinct effects depending on the source of the perceived tenure insecurity. This paper examines the determinants of perceived tenure insecurity across these two potential sources of risk of tenure insecurity, i.e., idiosyncratic or private risk and collective or covariate risk of land tenure (in)security.

Figure 1. Conceptual framework of the drivers of land tenure insecurity
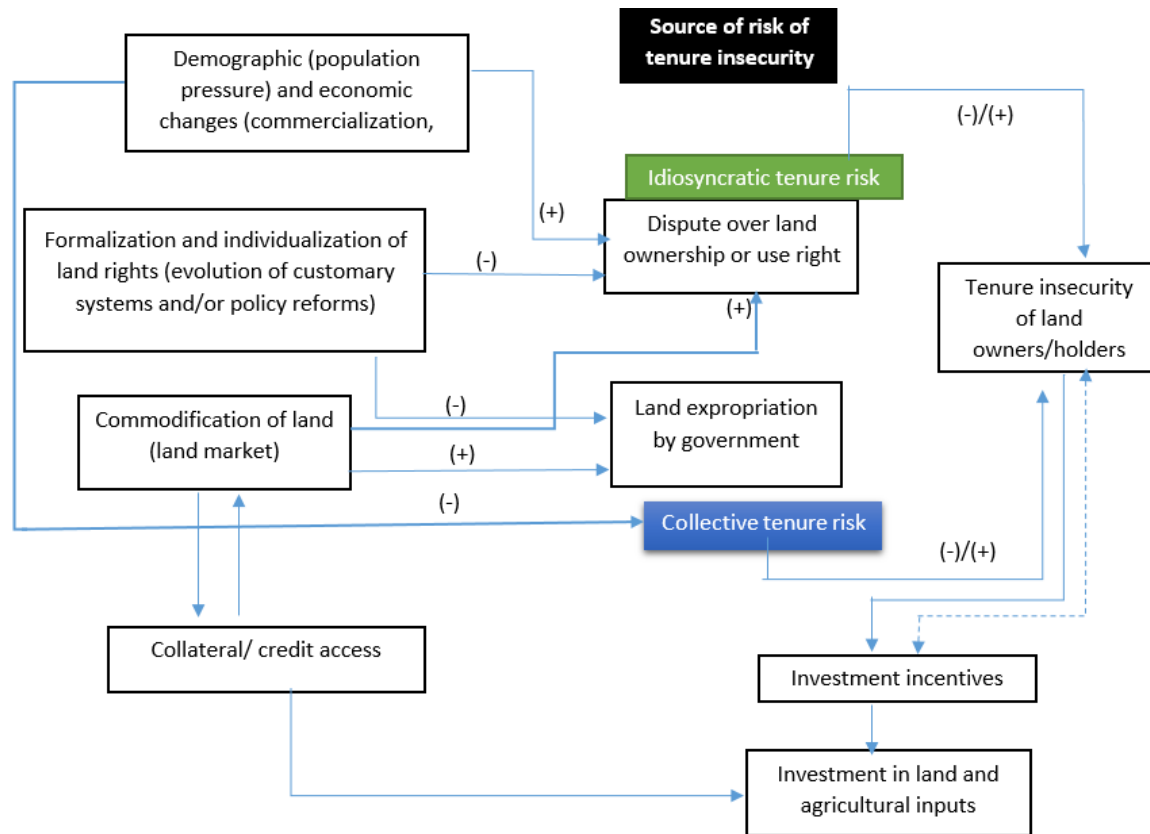
Source: Adapted from Ghebru, Khan, and Lambrecht (2016).

Figure 1 illustrates the conceptual framework for the determinants of tenure insecurity and how the effects of these determinants on tenure insecurity varies depending on the sources of tenure insecurity. As indicated by negative signs, individualization and formalization of land rights provide a greater sense of tenure security and a lower risk of land loss through reducing the incidence of private land dispute and land expropriation by the government (Besley and Ghatak 2010; Bouquet 2009). Formalization offers tenure security if it coexists with an institutional setup which can protect and enforce land rights (Bromley 2008). However, formal registration and land titling do not necessarily imply secured tenure (Bruce and Migot-Adholla 1994; Bromley 2008; Arnot et al. 2011). Formal land rights may cause conflict in cases where overlapping interest exist on same parcel of land used for different purposes (Bromley 2008). Formalization of land rights also calls into question the tenure security of the least powerful and least educated segments of society because of the high costs of registration and gaps in understanding land titling procedures (Hartwig and Houngbedjino 2015).

The availability of a land market facilitates the transfer of land to productive users and the use of land as collateral in the financial market (Ali et al. 2014). In addition, it also improves access to land for households with scarce land and serves as a source of income for households with abundant land but limited non-land resources, like agricultural labor and farm management knowledge (Holden et al. 2008 cited in Holden and Otsuka 2014). However, transferability of land in terms of sale, rent, or sharecropping could be a source of insecurity and conflict due to the monetary incentive and will also increase landlessness (Chimhown and Woodhouse 2006; Boudreaux and Sacks 2009). The legalization of land markets unexpectedly generates informal land markets characterized by under-registration of transactions, which results in tenure insecurity for the buyers (Bouquet 2009). Commodification of land, either as source of conflict or as cause for the emergence of informal land markets, is assumed to increase tenure insecurity in both cases of private and collective tenure risk, which is shown by positive signs in Figure 1.

In the past few decades, significant changes that affect land tenure systems have occurred in the developing world. These include demographic growth, urbanization, migration, livelihood diversification, monetization of the economy, greater integration in the global economy, and cultural change. Such changes have had major implications on the African 'traditional' or 'customary' land tenure systems, in particular (Cotula and Neves 2007). Today, 'customary' land tenure systems encompass a wide range of mechanisms that combine customary, statutory, and other norms (Pottier 2005). Population growth increases the population density in areas with arable land, possibly leading to competition for it. On the other hand, demographic growth, together with agricultural intensification, increases the value of land, which leads to the transformation of communal tenure to the individualization of land rights (Boserup 1965). It can be concluded that demographic and economic changes might increase the risk of private tenure insecurity due to higher competition for land, whereas, these changes might reduce the risk of collective tenure insecurity as a consequence of improved recognition of land rights as indicated by positive and negative signs in Figure 1, respectively.

Migration in its different forms – international, rural to urban, or rural to rural – has affected land tenure systems in rural areas. Because of international migration, remittances-receiving households are more likely to secure their land rights since income from remittances increases the ability of such households to pay the costs related to the land titling process (Cotula and Toulmin 2004). Following rural to urban migration, urbanization increases the demand for land for residential and commercial purposes, which changes the customary tenure system to an individualized one and leads to the emergence of informal land markets, increases in land values, and increased disputes over land ownership (Cotula et al. 2004; Chimhowu and Woodhouse 2006). In the context of rural to rural migration, such migration changes the composition of rural communities and may lead to disputes between indigenous inhabitants and the migrants over land rights (Cotula et al. 2004). Migrants have less access to land as compared to indigenous peoples, which reflects a lower level of tenure security (Place 2009).

Under customary tenure systems, tenure security depends on observable and unobservable characteristics of the landholder, such as gender, social status, and political power (Hartwig and Houngbedjino 2015). In addition, women have inferior rights over land in terms of the allocation and inheritance of land (DFID 2003). Empirical findings show that tenure security and investment in land have a bi-directional relationship – investments in the form of tree planting or constructing irrigation canals or other fixed structures on the land are done with the aim of securing rights over the land (Bromley 2008).

3.   LAND TENURE AND TENURE SECURITY IN NIGERIA

Land tenure systems in Africa are diverse due to the presence of different ethnic groups and institutions, rates of population growth, rates of market development, climate and ecologies, and degree of government influence in local tenure arrangement (Place 2009). Nigeria shares this heterogeneity in these factors.

Land tenure in Nigeria has passed through various systems and laws before the adoption of the Land Use Act in 1978. All land in Nigeria originally was governed by indigenous customary tenure law. However, in northern Nigeria, the customary land tenure system was replaced by Islamic law following the formation of the Sokoto Caliphate in 1800's (Ghebru and Okumo 2016). Whereas customary law continued to govern in southern Nigeria until British colonization, English law was implemented in land governance in the entire country afterwards. After independence, the Northern Nigeria Land Tenure Law of 1962 replaced the colonial-era law, whereas customary law continued in southern Nigeria (Oshio 1990; Ghebru and Okumo 2016). The Land Use Act was enacted with the aim of unifying land governance in the country and resolving various challenges of land administration and management (Ghebru and Okumo 2016). The Act allows individuals to have customary and statutory right of occupancy in rural and urban areas, respectively. States and local governments have the duty of land management both in urban and rural areas. In rural areas, local government councils are given the authority for allocation of land and issuance of customary right of occupancy. However, in urban areas, states are responsible for issuance of statutory certificate of occupancy (Adeniyi 2013).

3.1 Formalization and Individualization

Under customary systems, land is regarded as the property of the community and is administered by the village head, chief, or *oba* (head chief) for the benefit of the community. All members of the community or family have equal rights to the land (Oshio 1990; Aluko and Amido 2006). In rural communities, all household members are entitled to use a portion of the land they gain through inheritance, allocation by chiefs, leasing, borrowing, pledge, or gift (USAID 2010). However, household members might have overlapping interests over the same plot of land. The customary tenure system differs from community to community (Oshio 1990).

Land governance systems in Nigeria protect the rights of Nigerians to the land through recognition of both customary and statutory occupancy rights. However, the Land Use Act of 1978 was not successful in formalizing land rights through registration due to information gaps and costly and bureaucratic registration processes (Ghebru and Okumo 2016). Formally registered land in the country accounts for less than 3 percent of the land (Adeniyi 2013). In recognition of this, in 2009 the government of Nigeria under the leadership of then President Umaru Musa Yar'Adua proposed the amendment of the Land Use Act and set up a Presidential Technical Committee on Land Reform (PTCLR) to lead the implementation of a land reform program. The PTCLR, among other things, aims to undertake a Systematic Land Titling and Registration (SLTR) process throughout the country. In 2012, PTCLR announced the selection of two states (Ondo and Kano) for a pilot scheme of land reform in the country and undertook Systematic Land Titling and Registration (SLTR) in these states in 2013 as part of the reform. The SLTR is expected to improve tenure security, facilitate the growth of land markets, and provide public access to land records (Ukaejiofo and Nnaemeka 2014).

3.2 Commodification of land

Nigeria has a long history of private land markets prior to the adoption of the 1978 Land Use Act (Butler 2010). Under customary law, with the consent of the community, members could partition or sell their land (Maduekwe 2014). The Land Use Act ended private ownership and established customary and statutory right

of occupancy (Butler 2012). The Act formally banned the purchase, sale, or rental of land (Boudreaux and Sacks 2009). Individuals gain access to land through various mechanisms which involved market and non-market transactions. Acquisition of land through market transactions comprises purchase (transfer of title), lease, and sharecropping (Kenneth et al. 2010). Right of occupancy can be transferred with official consent of the state and local governments, which requires elaborate land bureaucracies and administrative procedures. Thus, the complex land transactions procedure gave rise to the growth of vibrant informal land markets, which increased the probability of fraud and unreliability of titles and transactions and reduced tenure security (Butler 2012). Lease arrangements involve the payment of rent to the owner of the land. However, leasehold is not recognized by the Land Use Act of 1978 (Kenneth et al. 2010). Under sharecropping, the user cultivates the land but the produce is shared between the user and the owner based on agreed proportion. Even though sharecropping is currently restricted to customary property, it used to be a common practice in the crop belts of Nigeria (Kenneth et al. 2010). On the other hand, inheritance, illegal squatting, adverse possession, gift, and customary traditional means (land access under the custody of traditional chiefs) are the means of access to land via non-market transactions (ibid).

3.3 Women and vulnerable groups

Although statutory law asserts the equality of women in property rights, practically, in most rural areas the law has failed to address the challenges women face regarding land ownership and accessibility. Under customary law, women are not entitled to own land and women's land rights are dependent on their relation with men (Aluko and Amidu 2006). Even though women might have the right to live in and use land under customary law, they are denied the right to inherit land. However, the extent of land rights of women varies among ethnic groups and religions (Madu 2013). In the northern part of Nigeria, divorced Muslim women are permitted to retain all her personal property, including land (Aluko and Amidu 2006). In addition, under Sharia law, widows can inherit their husbands' properties together with the children, though the share is small (FAO). Tenure security of women is weak in cases of polygamous marriages, since the husbands assign different fields to their wives each cropping season (FAO).

Under customary tenure, traditional chiefs have been found to use communal land as means of enriching themselves rather than keeping it for the benefit of the community members. This phenomenon resulted in increases in land prices and insecurity of tenure whereby the same plot was sold to different persons at different time. The allocation of land by the state was biased towards persons who have close connections with officials and who are wealthy (Oshio 1990).

4.   DATA AND METHOD

4.1 Data

To investigate the drivers of perceived tenure insecurity in Nigeria, the study used the second wave of the Nigeria Living Standards Measurement Study-Integrated Surveys on Agriculture (LSMS-ISA) panel survey collected by the National Bureau of Statistics of the government of Nigeria in collaboration with the World Bank between 2012 and 2013.[2] The second wave of the survey involved two visits to sample households, once

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[2] The Nigeria LSMS-ISA dataset is a nationally representative and cover all the geographical regions which collected information on almost all aspects of household and community activities. This study only uses the second wave dataset (2012-2013) as the comprehensive land tenure module was only administered only during the second-wave LSMS-ISA and not in wave-1 and wave-3.

during the post-planting period and once during the post-harvest period. The post-planting data is used for this study, as this visit involved the administration of a comprehensive land tenure module. Since only households who have at least one farm parcel that they own or cultivate were eligible to respond to the land tenure module, the overall survey sample size of 4,749 households was reduced to 2,976 households who operate 5,893 plots. However, here the analysis is done by excluding rented-in plots, due to potential estimation bias, since such plots are characterized by temporary access to land and, hence, with a greater likelihood of tenure insecurity. Thus, the final sample used for the main analysis here was made up of 2,742 households and 5,323 plots.

In this study, our variable of interest, tenure insecurity, is proxied by perception-based indicators, namely: private (idiosyncratic) tenure risk/insecurity and collective (covariate) tenure risk/insecurity. On the one hand, private (idiosyncratic) tenure risk is derived as a dichotomous variable equal to one if plot holder's response is "Yes, likely" to a plot-specific question "Is it likely that someone will dispute/contest ownership or use right over a given plot?", and zero if otherwise. On the other hand, collective (covariate) tenure risk/insecurity is derived as a dichotomous variable equal to one if plot holder's response is "No" to a plot-specific question "Are you confident that you will not lose land due to government expropriation?", and zero if otherwise. Such an approach of using households' perception on future risk of land loss, dispute, or expropriation is an emerging indicator as a proxy for measuring tenure (in)security. The individual's subjective perception of their own tenure situation is identified as an important factor that influences their behavior (Van Gelder 2010). A household's investment in land could be based on the perception they have regarding tenure security in the future since the return of investment will be realized in the future. Moreover, a subjective perception of tenure (in)security may be equally important, since households base their perception on insufficient information (lack of awareness) or fear (ibid.).

4.2 Hypotheses

Using the conceptual framework presented in section 2 and the definition of our key variables of interest as a proxy for tenure insecurity, the following hypotheses on the determinants of perceived tenure insecurity are differentiated based on the two source of tenure insecurity, namely: perceived risk of private land dispute (idiosyncratic tenure risk) and perceived risk of land expropriation (covariate tenure risk). Using plot and household-level data for the empirical analysis, this study tests the following hypotheses:

H1: Among female-headed households, as compared to male-headed households, the perceived risk of private land dispute is higher, whereas the perceived risk of land expropriation is lower.

H2: Both the perceived risk of private land dispute and the perceived risk of land expropriation are higher among female plot managers in female-headed households compared to female plot managers in male-headed households.

H3: Both the perceived risk of private land dispute and the perceived risk of land expropriation are lower for households who have close social or political connections with community political leaders.

H4: Both the perceived risk of private land dispute and the perceived risk of land expropriation are lower among plot holders who acquire land through market-based transaction as compared to plot holders who acquire land through customary land allocation mechanisms.

H5: For plot holders who reside in communities with a vibrant economy, the perceived risk of private land dispute is higher, whereas the perceived risk of land expropriation is lower.

H6: For plot holders who reside in communities where there is an active land market, both the perceived risk of private land dispute and the perceived risk of land expropriation are higher.

H7: For households who are located close to urban centers, both the perceived risk of private land dispute and the perceived risk of land expropriation are higher.

H8: As the number of years since a plot was acquired by a plot holder increases, both the perceived risk of private land dispute and the perceived risk of land expropriation become lower.

4.3 Empirical method

This study employed a probit model to analyze the determinants of perceived tenure insecurity. Two models are estimated based on the two indicators of perceived tenure insecurity: perceived risk of private land dispute; and perceived risk of land expropriation by the government. The regression analysis is based on the following equation:

$$PTISp_{p,c} = \beta_0 + \beta_1 FP_p + \beta_2 FHH_h + \beta_3 FP_p * FHH_h + \beta_4 FP_p * MH_h + \beta_5 FHh_h * LA_h + \beta_6 LM_c$$
$$+ \beta_7 EV_c + \beta_8 FU_p + \beta_9 DC_p + \beta_{10} YA_p + \beta_{11} PP_p + \beta_{12} HH_h + \beta_{13} CC_c + \beta_{14} ZD$$
$$+ \varepsilon_h + \varepsilon_p + \varepsilon_c$$

The dependent variables for the first model ($PTISp_P$) and second model ($PTISp_c$) represent private tenure insecurity risk and collective tenure insecurity risk, respectively, where:

$PTISp_P$ takes the value 1 if the plot holder perceived that there is a likelihood of a private dispute regarding ownership or use right over a plot; and 0, otherwise,

$PTISp_c$ takes the value 1 if the plot holder is not confident that he or she will not loss the plot due to government expropriation in the next five years; and 0, otherwise.

The key explanatory variables used in our analysis are the following (the signs of each variable shown in first and second parentheses indicate the expected relationship with the dependent variable in the first and second model, respectively):

FP_p – indicator variable for plot that is managed by a female, (-/+), (-/+);
FHH_h – indicator variable for a female-headed household, (+), (-);
FP_p*FHH_h- Interaction term of plot managed by a female with a female-headed household, (+), (+);
FP_p*MH_h – interaction term of plot managed by a female with a monogamous household, (+/-), (+/-);
FHH_h*LA_h – interaction term of female-headed household with household that is relatively land abundant, (-), (-);
LM_c – proxy for land market vibrancy, dummy variable that takes a value of 1 if the proportion of households in the community who participate in the land market is greater than the aggregate sample median proportion of participants in the land market, and 0 otherwise, (+), (+);
EV_c – proxy variable for economic vibrancy, dummy variable that takes a value of 1 if proportion of households in the community with modern roofing materials is greater than the aggregate sample median proportion of households with modern roofing materials, and 0 otherwise, (+), (-);

SC_h – proxy variable for political connectedness dummy variable that takes a value of 1 if a household has abundant land relative to the community,3 (+), (+);

FU_p – dummy for a plot used free of charge (reference group is purchase), (+), (+);

DC_p – dummy for a plot acquired via distribution by community or family (reference group is purchase), (+), (+);

YA_p – number of years since acquisition of a plot, (-), (-);

ZD – zone dummy for Nigeria's geopolitical zones (reference group is North Central), (+/-), (+/-);

PP_p – other plot-level variables, (+/-), (+/-);

HH_h – other household-level variables, (+/-), (+/-);

CC_c – other community-, village-, or cluster-level variables, (+/-), (+/-); and

$\epsilon_p, \epsilon_h, \epsilon_c$ – error terms at plot, household, and community-level

4.4 Robustness checks and sensitivity analysis

The robustness of the results on the key variables of interest – the statistical significance and respective expected signs – is tested by running eight distinct regressions models using a series of alternative model specification. Such sensitivity analyses were conducted using three parameters: i) parametric regressions with and without plots acquired temporarily, i.e., acquired via rent or sharecropping; ii) regressions with and without urban samples; and iii) alternative models specifications with and without controlling for unobserved household heterogeneity. Regarding the latter, we run similar models with similar covariates, but with a linear probability household fixed effects model instead of a binary probit model. Table 4.1 shows the model specifications used to conduct the sensitivity analysis.

Table 4.1. Model specifications used for sensitivity analysis

	Sample			
Models	Includes rented and share-cropped plots	Excludes data from urban dwellers	Model controls for household fixed effects	Observations
1	Yes	Yes	No	4,848
2 +	Yes	No	No	5,454
3	No	Yes	No	4,425
4 ++	No	No	No	4,930
5	Yes	Yes	Yes	4,848
6	No	No	Yes	5,454
7	Yes	Yes	Yes	4,425
8	No	No	Yes	4,930

Note: + Same model specification reported as the main findings under Table 6.1 - Model 1a and 2a.
       ++ Same model specification reported as the main findings under Table 6.1 - Model 1c and 2c.

5.   DATA AND DESCRIPTIVE STATISTICS

Table 5.1 describes the tenure insecurity indicators, the perceived risk of private land dispute and the perceived risk of land expropriation by government, at plot-level and at household-level. The perception of plot holders of the likelihood that someone will dispute ownership or use rights over their plot(s) is used to construct the variable on the perceived risk of a private land dispute. Plot holders were asked the question, "How likely is

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[3] The case where per-capita plot size of a household is greater than Local Government Area (LGA) median per-capita plot size.

that someone will dispute your ownership or use right over your plot?" for each of their plots. The question had six possible responses: *extremely likely, very likely, moderately likely, somewhat likely, slightly likely* and *not at all likely*. Thus, perceived risk of private land dispute takes a value of one if the plot holder responds between *extremely likely* and *slightly likely*, which refers to the plot holder being tenure insecure; and 0 if land dispute is *not at all likely*. Similarly, the variable on the perceived risk of land expropriation by government is generated from the plot holder's response regarding their confidence level that they will not lose land due to government expropriation in the next five years. The variable takes the value of one if the plot holder is not at all confident that he or she will not lose the plot due to government expropriation; and 0 if the plot holder ranks the level of confidence between *extremely confident* and *slightly confident*. Accordingly, 44.1 and 14.2 percent of the households are tenure insecure based on their perceived risk of a private land dispute and government land expropriation, respectively. For plot holders, 40.9 and 13.4 percent have the perception that they will lose their plot due to a private dispute and government expropriation, respectively.

Table 5. 1 Land tenure insecurity indicators

Tenure insecurity indicators	Plot-level			Household-level		
	Total	Freq.	Percent	Total	Freq.	Percent
Perceived risk of private land dispute	5,323	2,134	40.9	2,742	1192	43.7
Perceived risk of land expropriation by government	5,323	756	13.4	2,742	422	14.1

Source: Nigeria General Household Survey-Panel, LSMS-ISA (2012/13).

Table 5.2 presents general household characteristics and mean comparison by tenure insecurity indicators of perceived risk of a private land dispute and perceived risk of government expropriation. The household-level analysis indicates that 11.8 percent are female-headed households. Regarding the type of marriage, 25.6 percent of the households are polygamous households. The average age of household heads is around 53 years. The average household size is 6.7 members.

Table 5.1 Household characteristics and mean comparison by land tenure insecurity indicators

Variables	All	Perceived risk of private dispute		Perceived risk of expropriation	
		Yes	No	Yes	No
Female-headed household	0.118	0.104	0.129*	0.152	0.113*
Polygamous household	0.256	0.247	0.263	0.241	0.258
Age of household head	53.0	51.0	54.5***	55.0	52.6**
Household size	6.70	6.74	6.58	6.58	6.67
Household head's primary occupation					
Farming	0.721	0.792	0.785	0.757	0.793
Public employee	0.064	0.078	0.064	0.069	0.070
Private employee	0.014	0.010	0.019*	0.023	0.014
Self employed	0.826	0.897	0.909	0.903	0.904
Secondary occupation is farming	0.179	0.466	0.435	0.563	0.430***
Farming primary or secondary occupation	0.864	0.954	0.938*	0.942	0.946
Household head's marital status					
Married	0.828	0.873	0.840**	0.817	0.861*
Divorced	0.014	0.008	0.018**	0.005	0.015***

Widowed	0.117	0.107	0.133*	0.157	0.115*
Single	0.010	0.012	0.009	0.022	0.008*
Married monogamous	0.612	0.672	0.601***	0.602	0.638
Married polygamous	0.215	0.201	0.236*	0.215	0.222
Total plot size (hectares)	0.797	0.796	0.800	0.858	0.788
Number of years since first plot acquisition	23.80	22.58	24.89***	25.37	23.64
Total number plots by a household	1.90	1.85	1.93*	1.88	1.90
Observations	2,742	1,192	1,516	2,286	422

Source: Nigeria General Household Survey-Panel, LSMS-ISA (2012/13).

*** is <=1%, ** is 5% and * is 10% level of significance.

With respect to household heads' occupation, 72.1 percent are engaged in farming as primary occupation whereas, farming is primary or secondary occupation for 86.4 percent of household heads. The average number of cultivated plots by a household is just below two. The average plot size operated by a household is 0.88 hectares; whereas, the average per-capita plot size is around 0.14 hectares. The average number of years since the household first acquired a plot is 23.8 years.

Female-headed households are less likely to be at risk of a private land dispute, but perceive themselves to be more likely to lose land due to government expropriation. As the age of the household heads increase, the likelihood of a private land dispute decreases. However, the likelihood of land expropriation by government increases with the age of the household head, based on the perception of the head. The proportion of households who are engaged in farming as primary or secondary occupation (95.4 percent) is significantly higher among tenure insecure groups under a perceived risk of a private land dispute.

The household head being married is positively associated with a perceived risk of a private land dispute and negatively associated with a perceived risk of government expropriation. A significantly higher proportion of married heads perceive that there is a likelihood of a private land dispute (87.3 percent) and no likelihood of government land expropriation (86.1 percent). In contrast, a significant higher proportion of widowed heads fear government land expropriation (15.7 percent) but they perceive that a private land dispute is not likely (13.3 percent). The relationship between widowed heads and tenure insecurity is similar to that of female-headed households where a cross tabulation of these two variables indicates that 84.5 percent of widowed heads are female-headed households. Regarding the relationship between the type of marriage and tenure insecurity, a significant higher proportion of heads in monogamous marriages (67.2 percent) and polygamous marriages (23.6 percent) are within tenure insecure and tenure secure group, respectively, based on the indicator of a perceived risk of a private land dispute. The reverse holds true for the perceived risk of government land expropriation, although the relationship is not significant.

The perceived risk of a private land dispute is negatively associated with the total number of cultivated plots by a household. The average number of cultivated plots is higher for tenure secure groups (1.93) than tenure insecure groups (1.85), based on the indicator of a perceived risk of a private land dispute.

Table 5.2 Plot characteristics and mean comparison by land tenure insecurity indicators

Variables	All	Perceived risk of private dispute		Perceived risk of expropriation	
		Yes	No	Yes	No
Plot is managed by female	0.178	0.158	0.193***	0.218	0.173**
Females have the right to inherit the plot	0.147	0.148	0.145	0.112	0.151***
Females have the right to sell plot or use as collateral	0.073	0.064	0.078*	0.065	0.073
Plot acquired through purchase	0.061	0.049	0.068**	0.029	0.065***
Plot used free of charge	0.139	0.159	0.125***	0.203	0.129***
Plot acquired through distribution by community or family	0.800	0.793	0.806	0.768	0.806*
Plot is fallowed	0.020	0.016	0.016	0.010	0.016
Plot is rented out	0.003	0.002	0.003	0.000	0.003***
Plot has clear boundary demarcation	0.652	0.694	0.636***	0.635	0.664
Plot has manmade boundary demarcation	0.453	0.490	0.436***	0.412	0.466**
Plot boundary demarcated by fence	0.014	0.013	0.016	0.015	0.015
Plot with natural boundary demarcation	0.085	0.081	0.090	0.118	0.081**
Plot has permanent crops	0.129	0.102	0.151***	0.143	0.128
Plots has annual crops	0.667	0.704	0.645***	0.619	0.677**
Plot size (hectares)	0.466	0.467	0.466	0.546	0.455**
Number of years since plot acquisition	22.879	22.161	23.387**	23.997	22.716
Plot distance (in km) to household	1.521	1.842	1.270	1.209	1.559
Observations	5,323	2,134	3,110	756	4,488

Source: Nigeria General Household Survey-Panel, LSMS-ISA (2012/13).
*** is <=1%, ** is 5% and * is 10% level of significance.

Table 5.3 presents plot characteristics and mean comparison by tenure security indicators. The response on the mode of plot acquisition by the plot holder indicates that the majority (80.0 percent) of the plots were acquired through distribution by community or family, and 13.9 percent are used free of charge. Plots acquired through purchase constitute 6.1 percent. 97.4 percent of the plots are cultivated by household members. Plots which are not cultivated by the household member are either left fallow (2 percent), rented out (0.3 percent) or sharecropped (0.1 percent).

Regarding plot demarcation, 65.2 percent of the plots are clearly demarcated. For 45.3 percent of the plots, demarcation is created by one of the household members. 1.4 and 8.5 percent of the plots have fence and natural boundary as demarcation objects, respectively.

Information on acquisition of legal title was obtained only for plots acquired through purchase. Accordingly, plot holders have legal title for 51.9 percent of the purchased plots.

With respect to the type of crop cultivated on the plots, 12.9 percent of the plots are covered with permanent crops, whereas 66.7 percent of the plots are covered with annual crops, which include cereals and pulses. The share of urban plots is 12.5 percent. Average plot size is around 0.47 hectare. The average number of years since the plot was acquired is 22.9 years.

Information on plot management reveals that 17.8 percent of plots are managed by female household members. Concerning inheritance rights, 14.7 percent of the plots are stated to be inherited by females. The right to sell the plot or use it as collateral is allowed for females for 7.3 percent of the plots.

A significantly higher proportion of plots that are perceived to be secure from the risk of private dispute (19.3 percent) and plots that are perceived to be at risk of government expropriation (21.8 percent) are managed by females. Similar to the household-level analysis of female-headed households and tenure insecurity, female plot managers have a greater public tenure risk (perceived fear of land expropriation by government) than private tenure risk. For plots in which females have the right to inherit, a significantly higher proportion (15.1 percent) are confident that they will not lose land due to government expropriation. Likewise, a significantly higher proportion of plots in which females have the right to sell or use the land as collateral are within the tenure secure groups (7.8 percent) in the case of a perceived risk of private land dispute. With respect to the association between mode of plot acquisition and tenure security, a significantly higher proportion of tenure secure plots are acquired through purchase both under the perceived risk of private land dispute (6.8 percent) and perceived risk of government land expropriation (6.5 percent) measures. On the contrary, a significantly higher proportion of tenure insecure plots are used free of charge both under perceived risk of private land dispute (15.9 percent) and perceived risk of government land expropriation (20.3 percent). Plots acquired through purchase and plots used free of charge reveals similar relationship with tenure insecurity irrespective of the source of tenure insecurity. A significantly higher proportion of plots acquired through distribution by community or family (80.6 percent) are within the tenure-secure group in case of perceived risk of government expropriation.

A significantly higher proportion of plots with manmade boundaries are within the group where private land dispute is likely (49 percent) and land expropriation by government is not likely (46.6 percent). This might indicate that plot boundaries are made by households in response to fear of private land dispute rather than due to a fear of losing land due to government expropriation. Perceived risk of private land dispute is positively associated with plots having clear boundary demarcation. Thus, a significant higher proportion of tenure insecure plots (69.4 percent) have clear boundary demarcations. Plot holders put in place clear boundary demarcations when they have a sense of insecurity of potential private disputes over land rights.

Perceived risk of private land dispute is negatively associated with plots cultivated with permanent crops, whereas, it is positively associated with plots cultivated with annual crops. Accordingly, a significantly higher proportion of plots cultivated under permanent crops (15.1 percent) are associated with greater tenure security while plots cultivated with annual crops (70.4 percent) are characterized as tenure insecure. Plot holders who fear the risk of land expropriation by the government have larger mean plot size (0.546 hectares) than do secure plot holders (0.455 hectares).

Table 5.3 Female control over land and perceived land tenure insecurity

Variables	All	Perceived risk of private dispute		Perceived risk of expropriation	
		Yes	No	Yes	No
Plot is managed by female	0.178	0.158	0.193***	0.218	0.173**
Female-managed plot in male-headed monogamous household	0.314	0.328	0.303	0.310	0.312

Female-managed plot in male-headed polygamous household	0.074	0.028	0.102***	0.057	0.079
Female-managed plot in female-headed household	0.611	0.644	0.595	0.632	0.609
Observations	948	354	594	173	775

Source: Nigeria General Household Survey-Panel, LSMS-ISA (2012/13).

*** is <=1%, ** is 5% and * is 10% level of significance.

Table 5.4 presents the relationship between female-managed plots and perceived tenure insecurity disaggregated among female-managed plots under: (i) female-headed; (ii) male-headed monogamous; and (iii) male-headed polygamous households. Of the total plots managed by females, the majority (61.1 percent) are under female headed households, while the rest are under male headed monogamous (31.4 percent) and polygamous households (7.4 percent). Perceived risk of private land dispute is negatively associated with female-managed plots in male-headed polygamous households. Hence, a significant higher proportion of tenure secure plots (10.2 percent) are managed by female in male-headed polygamous households.

Table 5.5 presents the comparison of tenure secure and insecure plots by various household characteristics using the two tenure security indicators: perceived risk of private land dispute and perceived risk of land expropriation by government. A significant higher proportion of tenure insecure plots due to the risk of government land expropriation are under female-headed households (14 percent). Average age of household heads is higher for plots under the group with no likelihood of private land dispute and for plots with likelihood of government land expropriation. The relationship between heads' occupation and perceived risk of private land dispute reveals that perceived risk of private land dispute is positively associated with being a public employee and negatively associated with being a private employee and self-employed. A significant higher proportion of tenure insecure plots are operated by public employees (8.3 percent), whereas a higher proportion of tenure secure plots are operated by private employees (2.0 percent) and self-employed heads (90.8 percent). On the other hand, perceived risk of land expropriation is positively associated with being self-employed and being a farmer as a secondary occupation. A significant higher proportion of self-employed heads (92.1 percent) and heads engaged in farming as a secondary occupation (55.7 percent) are within the tenure insecure groups. Considering the association between perceived risk of land expropriation and marital status of the head, a significantly higher proportion of married (86.8 percent) and divorced (1.2 percent) heads are with the tenure secure groups, while widowed (15.3 percent) and single (1.9 percent) heads are within the tenure insecure groups. In addition, a significant higher proportion of heads in monogamous marriages operate insecure plots in terms of private land dispute (67.3 percent) and secure plots from the perspective of government land expropriation (65.3 percent). Hence in monogamous marriages the risk of private land dispute is more prevalent than the risk of government land expropriation. In contrast, heads in polygamous marriages (22.6 percent) are associated with plots with no likelihood of private land dispute. Household distance to the nearest market is negatively associated with perceived risk of private land dispute – that is, tenure insecure plots are operated by households who are located near the market.

Table 5.4 Household characteristics and mean comparison by tenure security indicators-plot-level

Variables	All	Perceived risk of private dispute		Perceived risk of expropriation	
		Yes	No	Yes	No
Female-headed household	0.115	0.109	0.120	0.140	0.112*
Polygamous household	0.252	0.248	0.256	0.248	0.253

Household size	6.840	6.935	6.776	6.718	6.861
Age of household head	53.242	51.317	54.566***	54.749	52.986**
Household head's primary occupation					
Farming	0.782	0.785	0.784	0.762	0.788
Public employee	0.071	0.083	0.064**	0.057	0.074
Private employee	0.016	0.010	0.020**	0.019	0.015
Self employed	0.901	0.890	0.908*	0.921	0.898*
Secondary occupation is farming	0.470	0.484	0.460	0.557	0.456***
Farming primary or secondary occupation	0.944	0.950	0.943	0.935	0.948
Household head's marital status					
Married	0.862	0.871	0.855	0.823	0.868***
Divorced	0.012	0.008	0.014**	0.004	0.012***
Widowed	0.117	0.110	0.123	0.153	0.112**
Single	0.009	0.011	0.008	0.019	0.008**
Married monogamous	0.647	0.673	0.628***	0.607	0.653**
Married polygamous	0.214	0.198	0.226**	0.217	0.214
Household is in urban area	0.125	0.124	0.125	0.123	0.125
Household distance to nearest major road (km)	7.356	7.299	7.427	7.379	7.373
Household distance to nearest population center of greater than 20,000 persons (km)	21.392	21.550	21.366	20.768	21.548
Household distance to nearest market (km)	68.255	66.944	69.688**	69.789	68.360
Household has demand for credit	0.294	0.302	0.292	0.298	0.296
Observations	5,323	2,134	3,110	756	4,488

Source: Nigeria General Household Survey-Panel, LSMS-ISA (2012/13).

*** is <=1%, ** is 5% and * is 10% level of significance.

6.   RESULTS

This section presents the results of econometrics analysis and discussion on the determinants of perceived tenure insecurity at plot-level. Table 6.1 shows the regression results from the probit estimation using two proxies of perceived tenure insecurity: perceived risk of private land dispute (Model 1) and perceived risk of land expropriation by the government (Model 2) as dependent variables in the regression. For both Model 1 and Model 2, figures under (a) and (b) represent the result of regressions made without and with the variable household demand for credit using all plots, respectively. Whereas, figures under (c) are the regression results of the main analysis which is done by excluding rented-in plots as depicted in the last two columns of Table 6.1.

Table 6. 1 Factors associated with perceived land tenure insecurity – plot-level (marginal effects)

	All Plots				Excluding rented in plots	
	Model 1a	Model 2a	Model 1b	Model 2b	Model 1c	Model 2c
Explanatory Variables[1]	ME/se	ME/se	ME/se	ME/se	ME/se	ME/se
Plot manager is female	-0.259****	0.045	-0.258****	0.045	-0.243****	0.055
	(0.06)	(0.04)	(0.06)	(0.04)	(0.07)	(0.04)
Head of household is female	0.201**	-0.140**	0.212**	-0.139**	0.168	-0.142**
	(0.10)	(0.06)	(0.10)	(0.06)	(0.10)	(0.06)

Female plot manager*Female head	-0.178*	0.136**	-0.193*	0.135**	-0.134	0.135**
	(0.10)	(0.07)	(0.10)	(0.07)	(0.11)	(0.07)
Female plot manager*Family is monogamous	0.313****	0.053	0.317****	0.054	0.271****	0.046
	(0.07)	(0.04)	(0.07)	(0.04)	(0.08)	(0.05)
Female head*Household has abundant land	-0.081*	0.004	-0.087*	0.004	-0.079	0.022
	(0.05)	(0.03)	(0.05)	(0.03)	(0.05)	(0.03)
Community-level prevalence of land market †	0.034*	0.015	0.033*	0.015	0.034*	0.014
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Economic vibrancy ††	0.018	-0.01	0.015	-0.01	0.006	-0.028**
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Community-level years since plot acquisition †††	-0.036**	0.005	-0.037**	0.005	-0.056***	0.004
	(0.02)	(0.01)	(0.02)	-(0.01)	(0.02)	(0.01)
Plot size (in hectares)	0.001	0.024****	0.001	0.024****	-0.001	0.025****
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Plot has permanent crop cultivated	-0.065**	-0.015	-0.066**	-0.016	-0.081***	0.002
	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
Plot has manmade boundary demarcation	0.053****	-0.025**	0.051***	-0.025**	0.081****	-0.037****
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Used free of charge	0.154****	0.136****	0.155****	0.137****	0.156****	0.135****
	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)
Distributed by community or family	0.081**	0.056***	0.079**	0.056***	0.075**	0.053***
	(0.04)	(0.02)	(0.04)	(0.02)	(0.04)	(0.02)
Rented in	0.266****	0.116****	0.264****	0.116****		
	(0.04)	(0.03)	(0.04)	(0.03)		
Household has credit demand			0.034**	0.007		
			(0.02)	(0.01)		
Joint F-test other plot characteristics [i]	2.48	2.61	2.23	2.73	3.27	3.33
Joint F-test other household characteristics [ii]	20.83***	9.02	20.05***	8.97	25.51****	16.40**
Joint F-test zonal fixed effects [iii]	33.80****	42.09****	32.81****	42.53****	31.24****	57.84****
Pseudo R²	0.0333	0.0404	0.0341	0.0405	0.0324	0.0501
Observations	5,454	5,454	5,452	5,452	4,930	4,930
Prob > Chi²	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: Nigeria General Household Survey-Panel, LSMS-ISA (2012/13).

Notes:

† 1 if community proportion of households who participate in the land market is greater than the aggregate sample median proportion of participants in the land market, and 0 otherwise.

†† 1 if community proportion of households with modern roofing materials is greater than the aggregate sample median proportion of households with modern roofing materials, and 0 otherwise.

††† 1 if community proportion of households who acquired their first plot within the last 10 years is greater than the aggregate sample median proportion of households who acquired their first plot within the last 10 years, and 0 otherwise.

Regression results with detailed coefficients and signs of all variables included are presented in Appendix Table A1.

[i] Plot characteristics include variables log (number of years since plot acquisition) and plot is fallowed.

[ii] Household characteristics include dummy variables if household has abundant land and household is in urban area, household size, age of household head, religion of household head and household distance to the nearest population center (>=20,000 km).

[iii] Zonal fixed effects include dummy variables for five zones (North East, North West, South East, South South and South West by taking North Central as reference group).

For Model 1 and Model 2, the dependent variables are perceived risk private land dispute and perceived risk of land expropriation by the government, respectively.
Figure in parenthesis are standard errors; **** significant at 0.1%; *** significant at 1%; ** significant at 5%; * significant at 10%.

Perceived tenure insecurity of a private nature is significantly lower when the plot is managed by females. Hence, plots managed by females face less risk of private land disputes. Similarly, Ghebru et al. (2016) found female plot holders in Ghana have higher tenure security than male plot holders. Out of the total plots managed by female, the majority (42.6 percent) are found in South East of Nigeria followed by South-South Nigeria (30.2 percent) where customary tenure systems are the pre-dominant system (as compared to the North where Islamic land laws dominate). Female plot managers within female-headed households feel insecure in terms of risk of losing their land due to government expropriation. In contrast, the probability of private land dispute is significantly higher for female-managed plots under male-headed households with monogamous marriages. The above two contrasting results indicate that plot managers in female-headed households are more sensitive to land expropriation by the government, which may be due to limited exposure to rules and regulations on land and social connection with political leaders as compared to plot managers in male-headed households.

On the other hand, female-headed households are more likely to have private land disputes and are less likely to perceive a risk of losing land due to government expropriation. Nigerian customary law commonly restricts the inheritance rights of women upon the death of their husbands. Even if there are differences in customary laws across cultures and customs on rights of succession, it is almost the same when it comes to women's inheritance right of land (Madu 2013). In some situations, when a husband dies, the brother of the husband has the right to inherit his property, including land and marry his wife (ibid). Hence, the major tenure insecurity for widowed women comes from individuals rather than the government. In addition, due to the social status that they have in society, women might not be able to fully practice and protect their rights. However, female heads of households who have relatively abundant land compared to the community are less likely to be at risk of private land disputes.

A household having relatively abundant land as compared to the community is taken as a proxy for household's connectedness to community political leaders or chiefs. Since land distribution is made by community chiefs on behalf of the local government, there is a high probability that allocation of land to households will be influenced by the relationship that they have with the leaders. We see in our models that the probability of land expropriation by the government is lower for households who have social or political connection with community chiefs. This finding is in line with the empirical results revealed in Goldestine and Udry (2008) and Ghebru et al. (2016).

Perceived tenure insecurity at plot-level is influenced by community-level factors, such as land market vibrancy, economic changes, and years since plot acquisition. Perceived tenure insecurity is related to the extent of a land market in the community. Plot holders who live in communities where the land market is more vibrant are less tenure secure than plot holders found in communities with less vibrant land market. Both sources of perceived tenure insecurity are positively related with the community-level prevalence of land markets, but the relationship is significant for private tenure risk. As the economic value of a plot increases, the likelihood of having disputes will be high due to increased competition to acquire land. In addition, growing informal land markets, which emerge due to the high costs of formal registration and bureaucratic processes, could be a cause for tenure insecurity.

Economic changes are one of the factors that dictate the perception of risk by individuals towards tenure security. Most of the time, urbanization is associated with improved economic status of households. Hence, private tenure risk is more likely due to increase in the value of land, but collective tenure risk is less likely because of relatively better formalization and recognition of rights in urban areas. The results in this study also reveal that the probability of land expropriation by the government is lower in communities where the economic situation is relatively better.

Results also show that in communities where recent plot acquisition is relatively high, the probability of private land disputes are lower. Such findings are indicative of the positive influence that relative ease of access to land can have on perceived tenure security of households with regard to their fear of land dispute or loss of a private nature, such as ownership, inheritance, divorce, or boundary-related disputes. The indicator on community-level number of years since land acquisition (measured by the proportion of households in a community who acquired their latest parcel within the last 10 years) can also be an indicator for relative land abundance in a given community. Communities with a larger proportion of households with a history of recent land acquisition are characterized by reduced land-related disputes or enhanced perceived tenure security.

Perceived tenure insecurity is lower for plots acquired through purchase as compared to plots used free of charge and plots acquired through distribution by community or family, irrespective of the source of tenure insecurity. This may be due to such plot holders being able to provide formal or informal evidence of ownership for their purchased plots, which reduces the likelihood of ownership disputes from individuals or expropriation by the government.

There exists a positive and significant relationship between plot size and perceived tenure insecurity through expropriation by the government. It is expected that among the plots acquired by plot holders, fear of expropriation by the government is more likely for larger plots as compared to smaller plots. On the other hand, the number of years since plot acquisition has a significantly negative relationship with private tenure risk. As the years since plot acquisition increase, the probability of land dispute regarding ownership or use rights will reduce. In line with this finding, the risk of private land disputes is less likely for plots which have permanent crops. These two results imply that a sense of tenure insecurity declines as plot holders have possession of a plot over a relatively long duration. In addition, in rural society, planting permanent crops like trees is regarded as enhancing land rights.

Perceived risk of land expropriation by government is significantly lower for plot holders who leave their plots fallow. Fallowing is mainly used to increase the productivity of land. Hence, plot holders have the tendency to leave their plots fallow if they perceive that the risk of expropriation is minimum. Having manmade boundary demarcation on a plot is positively associated with private tenure risk, whereas, it is negatively associated with collective (government expropriation) tenure risk. This could be due to plot holders making boundary demarcations when they feel their ownership or use right over their plot could be disputed by other individuals. In contrast, the likelihood of land expropriation by the government is low for plots with manmade boundary demarcations.

Perceived risk of private land dispute is negatively associated with household distance to the nearest population center with greater than 20,000 inhabitants. Thus, tenure insecure plot holders are located nearer

to such population centers than are tenure secure plot holders. The value of land is expected to increase with increased proximity to urban centers. Hence, tenure security of plot holders may be eroded due to higher value of land together with the likelihood of land expansion. Households with demand for credit are the ones who borrowed money from formal banks and non-bank institutions, informal groups, friends or relatives, or those who attempted to borrow money but were refused. Since land is the major collateral for a loan both in formal and informal lending, households involved in any credit arrangements become more tenure insecure. Even in cases where land is not held as collateral due to lack of legal documents, lenders focus on assets like farming land and houses at times of default if the household has no other source to repay the loan. In line with this, the results from the regression including all plots shows that the probability of private land dispute is higher for households who have credit demand than households with no demand.

At zone level, perceived risk of land expropriation by the government is significantly higher in the North East, South East, and South South zones and lower in the North West zone as compared to the North Central zone. Whereas, private tenure security risk is significantly lower in the South South and South West zones relative to the North Central zone.

As shown in Table 6.2, sensitivity analyses were conducted to test the robustness of the results (sign and significance) for key variables of interest by conducting robustness tests with alternative model specification using three parameters: i) parametric regressions with and without plots acquired temporarily (acquired via rent/sharecropping); ii) regressions with and without urban samples; and iii) alternative models specifications with and without controlling for unobserved household heterogeneity. Regarding the later, we run similar models (with similar covariates) but with a linear probability household fixed effects model instead of a binary probit model. The results from Table 4.2 show that, overall, our results remain robust regardless of which of the eight different model estimates is chosen. More specifically, of the six variables of interest included in our robustness test, three variables stood out to be the most robust and consistent (remains statistically significant with their respective expected signs), namely: "plot manager is female; "household is located in areas with vibrant land markets"; and "household resides in areas with relative ease of land access".

Table 6. 2 Robustness test for factors explaining drivers of perceived land tenure insecurity

	Sample			Signs and significance level of key variables of interest									
MODEL	Includes rented/share-cropped in plots	Excludes data from urban dwellers	Model controls for unobserved household hetero-geniety	Plot manager female		is Head of household is female		Vibrant land market (purchase and/ or rent) i		Vibrant economy (modernization) ii		Land accessibility iii		Observations
				Model 1†	Model 2††	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	
1	Yes	Yes	No	-0.253****	0.056*	0.125	-0.105	0.048***	0.003	-0.009	-0.006	-0.013	-0.011	4,848
2	No+	No	No	-0.259****	0.045	0.201**	-0.140**	0.034*	0.015	0.018	-0.01	-0.036**	0.005	5,454
3	Yes++	Yes	No	-0.222***	0.062**	0.069	-0.088	0.051***	0.004	-0.015	-0.017	-0.032*	-0.017	4,425
4	No	No	No	-0.243****	0.055*	0.168	-0.142**	0.034*	0.014	0.006	-0.028**	-0.056***	0.004	4,930
5	Yes	Yes	Yes	-0.044*	0.058***	-	-	-	-	-	-	-	-	4,848
6	No	No	Yes	-0.044*	0.055***	-	-	-	-	-	-	-	-	5,454
7	Yes	No	Yes	-0.040*	0.066****	-	-	-	-	-	-	-	-	4,425
8	No	Yes	Yes	-0.041*	0.066****	-	-	-	-	-	-	-	-	4,930

Source: Authors' computation using Nigeria General Household Survey-Panel, LSMS-ISA (2012/13).

Notes:

**** significant at 0.1%; *** significant at 1%; ** significant at 5%; and * significant at 10%

† The dependent variable is an indicator variable equal to 1 if plot holder perceived that there is likelihood/risk of private dispute regarding ownership or use right over a plot (such as cases ownership, inheritance, divorce related disputes); and 0, otherwise.

†† The dependent variable is an indicator variable equal to 1 if plot holder is not confident that he/she will not loss his/her plot due to government expropriation in the next 5 years; and 0, otherwise.

+ Same model specification reported as the main findings under Table 6.1 - Model 1a and 2a

++ Same model specification reported as the main findings under Table 6.1 - Model 1c and 2c

i 1 if community proportion of households who participate in the land market (purchase/rent) is greater than the aggregate sample median proportion of participants in the land market, and 0 otherwise.

ii 1 if community proportion of households with modern roofing materials is greater than the aggregate sample median proportion of households with modern roofing materials, and 0 otherwise.

iii 1 if community proportion of households who acquired a plot within the last 10 years is greater than the aggregate sample median proportion of households who acquired their plot within the last 10 years, and 0 otherwise.

7. CONCLUSIONS

This study used the second wave of the Nigeria Living Standards Measurement Study-Integrated Surveys on Agriculture (LSMS-ISA) panel survey from 2012/13 to investigate the drivers of perceived tenure insecurity in Nigeria. Perceived tenure insecurity is measured using two proxies: Perceived risk of private land dispute and perceived risk of land expropriation by the government. These measures are based on plot holders' response in the survey on the likelihood of private land dispute and losing land due to government expropriation in the next five years, respectively. Hence, the results of drivers of perceived tenure insecurity are compared between the two sources of tenure insecurity. Identifying and differentiating factors which are most associated with private tenure security risk and collective tenure security risk assists in taking policy measures which are more focused and compatible with the specific types of tenure risk and which are inclusive of different segments of the rural community.

The results from plot-level regression analysis show that perceptions of the probability of private land dispute is higher for female-headed households, whereas, perceptions of the probability of land expropriation by the government is lower for households who have social or political connection with community chiefs. This finding indicates that perceived tenure security is lower for vulnerable groups, such as women and the poor. Even though women's inheritance rights are acknowledged in statutory law, these rights are not assured in implementation or in integration with customary law. The probability of private land dispute and land expropriation is lower for plots acquired through purchase as compared to plots acquired via customary means of allocation. Thus, policy measures should focus on mechanisms as to how to secure land rights, both in terms of private and collective tenure security risk under customary tenure system, since customary systems of tenure accounts for how a larger proportion of land in the country is allocated.

At community-level, perceived risk of private land dispute is higher in communities where the land market is more vibrant. Similarly, private tenure security risk is higher for households who are close to urban centers. On the other hand, perceived risk of land expropriation by the government is lower in communities with improved economic situation. Hence, policy interventions should address tenure insecurity of a private nature in rural areas where the land market is more vibrant and in urban areas. Measures to enhance tenure security in those areas also help to reduce the operation of informal land markets.

Private tenure risk is higher while collective tenure risk is lower for plots which have manmade boundary demarcations. This implies that plot holders are more likely to put physical fixtures on their plot in response to the risk of private land dispute rather than in response to a risk of government land expropriation. Thus, policy measures related to land demarcation are required more in areas where private land disputes are the main source of tenure insecurity, rather than government land expropriation.

Overall, the results of our study reinforce the growing consensus that property rights under traditional or customary tenure systems are weakening due to social (migration, urbanization) and economic (commercialization and land commodification) transformations. A key finding of this study is that households reveal a higher risk of tenure insecurity (both private and public in nature) for parcels acquired via traditional institutions as compared to plots that were acquired through market-based mechanisms (purchased land). This is particularly so since land acquired via the market (purchase) is also more likely to be accompanied with some form of proof of land rights for the parcels obtained. Increased scrutiny of customary tenure systems is justified as the interests over land of individuals or households acquired via traditional or customary

institutions are normally without formal or other legally recognized documentation. Over the last decade or so, Nigeria has been at the forefront among countries in pursuing reforms to enhance land tenure security – with the systematic land tenure regularization program being the most notable one. However, as they tend to provide blanket solutions, such mega-projects may not necessarily guarantee success in securing land rights. Results from our study show that sources of tenure insecurity often are subject to local conditioning factors. Of particular note is that perception of tenure insecurity is positively associated with locations with vibrant land markets, while relative ease of land access seems to be associated with a relative sense of tenure security. Moreover, showing the importance of gender emphases in addressing issues of tenure insecurity, results from this study show that tenure security is relatively higher on female-managed plots of female-headed households while the opposite is the case for female-managed plots of male-headed households. Such findings are indicative of the need for Systematic Land Titling and Registration practice in Nigeria to operationalize parcel-based land registration rather than household-based land titling, so that such aspects of the intra-household tenure dimensions will be addressed.

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APPENDIX

Table A.1 Factors associated with perceived land tenure insecurity – plot-level (marginal effects)

Explanatory Variables	All Plots				Excluding rented-in plots	
	Model 1a	Model 2a	Model 1b	Model 2b	Model 1c	Model 2c
Plot manager is female	-0.259****	-0.045	-0.258****	-0.045	-0.243****	-0.055
	(0.06)	(0.04)	(0.06)	(0.04)	(0.07)	(0.04)
Head of household is female	0.201**	-0.140**	0.212**	-0.139**	0.168	-0.142**
	(0.10)	(0.06)	(0.1)	(0.06)	(0.10)	(0.06)
Female plot manager*Female head	-0.178*	0.136**	-0.193*	0.135**	-0.134	0.135**
	(0.10)	(0.07)	(0.1)	(0.07)	(0.11)	(0.07)
Female plot manager*Family is monogamous	0.313****	0.053	0.317****	0.054	0.271****	0.046
	(0.07)	(0.04)	(0.07)	(0.04)	(0.08)	(0.05)
Female head*Household has abundant land	-0.081*	0.004	-0.087*	0.004	-0.079	0.022
	(0.05)	(0.03)	(0.05)	(0.03)	(0.05)	(0.03)
Community-level prevalence of land market †	0.034*	0.015	0.033*	0.015	0.034*	0.014
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Economic vibrancy ††	0.018	-0.01	0.015	-0.01	0.006	-0.028**
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Community-level years since plot acquisition †††	-0.036**	0.005	-0.037**	0.005	-0.056***	0.004
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Plot size (hectares)	0.001	0.024****	0.001	0.024****	-0.001	0.025****
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Plot has permanent crop cultivated	-0.065**	-0.015	-0.066**	-0.016	-0.081***	0.002
	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
Plot has manmade boundary demarcation	0.053****	-0.025**	0.051***	-0.025**	0.081****	-0.037****
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Used free of charge	0.154****	0.136****	0.155****	0.137****	0.156****	0.135****
	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)
Distributed by community or family	0.081**	0.056***	0.079**	0.056***	0.075**	0.053***
	(0.04)	(0.02)	(0.04)	(0.02)	(0.04)	(0.02)
Rented in	0.266****	0.116****	0.264****	0.116****		
	(0.04)	(0.03)	(0.04)	(0.03)		
Log (number of years since plot acquisition)	-0.013	0.004	-0.012	0.004	-0.015*	0.005
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Plot is fallowed	0.021	-0.07	0.021	-0.07	0.033	-0.079*
	(0.06)	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)
Household has abundant land	0.022	-0.031**	0.021	-0.031**	0.018	-0.041***
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Household is in urban area	0.012	0	0.008	0.001	0.009	-0.001
	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
Household size	0.00	-0.001	-0.001	-0.001	-0.001	-0.003
	0.00	0.00	0.00	0.00	0.00	0.00

Explanatory Variables	All Plots				Excluding rented-in plots	
	Model 1a	Model 2a	Model 1b	Model 2b	Model 1c	Model 2c
Age of household head	-0.002****	0.001	-0.002****	0.001	-0.002****	0.001
	0.00	0.00	0.00	0.00	0.00	0.00
Religion of household head (Base=Christian)						
Islam	0.013	-0.001	0.017	0.00	0.005	0.002
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Traditional	0.032	-0.025	0.029	-0.025	0.075	-0.057**
	(0.05)	(0.03)	(0.05)	(0.03)	(0.05)	(0.03)
Household distance to nearest population center of greater than 20,000 persons (km)	-0.001*	0.00	-0.001*	0.00	-0.002**	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
Household have credit demand			0.034**	0.007		
			(0.02)	(0.01)		
Zone (Base=North Central)						
North East	0.012	0.046**	0.016	0.046**	0.017	0.054***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
North West	0	-0.052***	0.003	-0.051***	0.011	-0.050***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
South East	-0.063**	0.055**	-0.065**	0.056**	-0.037	0.071***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
South	-0.174****	0.080***	-0.170****	0.081***	-0.178****	0.111****
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
South West	-0.072**	0.001	-0.069*	0.002	-0.079*	-0.013
	(0.04)	(0.02)	(0.04)	(0.02)	(0.04)	(0.03)
Pseudo R²	0.0333	0.0404	0.0341	0.0405	0.0324	0.0501
Observations	5,454	5,454	5,452	5,452	4,930	4,930
Prob > Chi²	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: Nigeria General Household Survey-Panel, LSMS-ISA (2012/13).

Notes:

† 1 if community proportion of households who participate in the land market is greater than the aggregate sample median proportion of participants in the land market; and 0 otherwise.

†† 1 if community proportion of households with modern roofing materials is greater than the aggregate sample median proportion of households with modern roofing materials; and 0 otherwise.

††† 1 if community proportion of households who acquired their first plot within the last 10 years is greater than the aggregate sample median proportion of households who acquired their first plot within the last 10 years; and 0 otherwise.

For Model 1 and Model 2, the dependent variables are perceived risk private land dispute and perceived risk of land expropriation by the government, respectively.

Figure in the parenthesis are standard errors; **** significant at 0.1%; *** significant at 1%; ** significant at 5%; * significant at 10%.