

DOES LAND TITLE INCREASE AGRICULTURAL INVESTMENTS AND PRODUCTIVITY? EVIDENCE FROM TOGO

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Purpose. This paper assesses the effect of land title on agricultural investment and productivity in Togo. The purpose is to provide empirical evidence on the importance of land titles and so to encourage governments to promote land registration and facilitate small producers' access to land titles.

Results. The results show that land title positively affects investment decision of farmers and recursively the agricultural productivity. The possession of land title and customary rights increases the probability of investment respectively by 13 % and 21 % compared to farmers who do not have any rights on the land they exploit. The investment in turn, determines the level of productivity of the farmers.

Scientific novelty. The scientific novelty of this paper is to show that the possession of the land title does not have a direct effect on productivity. This effect passes through the investment which itself depend on credit. The recursive model estimated by instrumental variable regression approach appeared as an appropriated model to understand the effect of land security on the agricultural productivity.

Practical value. Since 2018, Togolese government has adopted a land code recognizing the land title as the main guarantee of land security likely to stimulate more agricultural investment and productivity. The results seem to indicate that legal land institutions do not protect the security of land tenure better than traditional institutions. Households, therefore, still essentially refer to local habits and customs that are accepted by their entire community. Public authorities must therefore recognize that local rights are as efficient as legal rights conferred by land title. However, to stimulate land titles demand, Government must remove constraints in land market. Specifically, he must struggle against corruption which plagues the country's legal land institutions.

Key words: land title, customary rights, agricultural productivity, instrumental variable regression.

Introduction. Some authors attribute the problems of economic stagnation and environmental degradation that prevails in poor countries today to local institutional constraints. Thus, the customary land rights have often been quoted and stigmatized as responsible for the low level of investment land and therefore low agricultural productivity (Chen, 2017; Singirankabo & Ertsen, 2020). In particular, many hold the view that the land tenure systems of Africa are in crisis. Because the customary tenure

systems usually do not confer title – or even fully 'individualized' use rights – and lack land markets, potential reformers argue that current institutions discourage efficient resources use and thus affect negatively the agricultural productivity (Lawry et al., 2017).

Reflections over the last five decades in economics have addressed the issue of land security in relation to agricultural productivity, especially in rural areas where agriculture is the main activity. The insecurity of land rights undermines investments and acts as a random tax on land (Lawry et al., 2017). Land tenure security removes this uncertainty. Farmers, reassured that they will be able to fully enjoy the productivity gains that will result from their investments, have an incentive to make such investments (Feder, 1988). Thus, securing property rights is seen as key to improving land resource use and agricultural development (De Soto, 2000). In addition, land tenure security refers to the legitimate and legal recognition of an individual's rights over land. Agricultural productivity refers to the output obtained for each unit of production factor used.

The economic literature on the issue of land security and agricultural productivity is of both theoretical and empirical interest. On the theoretical level, this issue includes the evolutionary theory of property rights (Coase, 1960; Deininger et al., 2003; Alston & Mueller, 2014). Thus, a hypothesis related to this theory of property rights stipulates that the enjoyment of an exclusive, durable and transferable property right on land encourages the farmer to invest more, in the short and long term, in order to reap all the profits that could be derived from the good management of this resource (Goldstein & Udry, 2008; Rao et al., 2020). Access to land title by farmers improves agricultural productivity through investment incentives, land market efficiency, reduced transaction costs and access to formal credit (Agbodji & Johnson, 2021). At the empirical level, the sometimes contradictory conclusions of studies do not allow for a real consensus on the implications of land security on the farmer's productivity. Indeed, while some researchers find a positive effect of land security on agricultural productivity (Lawry et al., 2017; Cordoba, 2017; Han et al., 2019; Chen, 2017; Abdulai et al., 2011; Melesse & Bulte, 2015), others, however, find no or negative effect (Singirankabo & Ertsen, 2020; Bellemare, 2013; Place & Otsuka, 2002; Chankrajang, 2015; Besley, 1995).

Customary land tenure systems are generally criticized for providing only a low degree of security and transferability of land (Goldstein & Udry, 2008). These observations led several African countries, like Togo, to carry out land reforms in the 1970s. In the case of Togo, before the 1974 land reform, land was subject to two competing regimes: the regulatory regime and the customary regime. The coexistence of these two competing regimes meant that not all land in Togo was subject to the same rule. It was therefore difficult for the Togolese government to take possession of unoccupied or insufficiently occupied land in order to organize its rational use. It was therefore necessary for Togo to adopt a land tenure system that would first allow for legislative unification. With the aim of organizing a better distribution and a more

judicious use of land, the government undertook to reform the 1974 land tenure system. In 2018, Togolese government has adopted a land code recognizing the land title as the main guarantee of land security likely to stimulate more agricultural investment and productivity.

Formal securitization provides an opportunity for the farmer to use the land title as collateral to access a bank loan in the form of credits (De Soto, 2000). Access to bank loans should enable Togolese farmers to have access to modern inputs (improved seeds, fertilizers, etc.), to adopt new production technologies (infrastructures, tractors, new processing and marketing techniques), and to protect themselves against natural uncertainties like climate change, pests and animal diseases and other unforeseen shocks (Agbodji & Johnson, 2021). Even if these advantages are real, they are not enough to predict their impact on agricultural investment and productivity.

The objective of this study is to assess the effect of land titles on investment and agricultural productivity in Togo. Does the land property right conferred by land titles increase agricultural investment and productivity? Otherwise, could the low level of investment and agricultural productivity be explained by the low level of security of agricultural land? Would the effect of land titles be greater than that of customary rights? The interest of the work is to highlight the importance of land titles and to encourage governments to facilitate producers' access to land titles.

The paper is organized in three sections. The first section presents the theoretical and empirical framework of the link between land property right, land security and agricultural productivity. The second section describes the methodological framework and the third section presents the results and discussion. A conclusion with land policy implications end the article.

Review of literature. The economic theory of property rights began in the 1960s with Coase (1960) article. Following Coase (1960), other researchers, through their work, have also contributed to provide a solid basis for the theory of property rights (Alchian & Demsetz, 1972; Alchian, 2018; Cole & Grossman, 2002). Thus, this theory of property rights is divided into two: the standard theory of property rights (Alchian & Demsetz, 1973) which is a theoretical debate on the inefficiency of common property and the efficiency of private property; and the evolutionary theory of property rights applied to land. Thus, a hypothesis relating to the evolutionary theory of property rights stipulates that the enjoyment of an exclusive, lasting and transferable property right over land encourages the farmer to invest more, in the medium and long term, in order to reap the profits that could be derived from the good management of this resource (Brasselle et al., 2002).

The verification of this theoretical hypothesis of the relationship between land tenure security and agricultural productivity has been the subject of much empirical research. However, the sometimes contradictory conclusions of the studies do not allow for a real consensus on the implications of land tenure security on the productivity of farmers. Indeed, as mentioned above, while some studies conclude that land tenure security has a positive effect on agricultural productivity, others find

opposite results or no effect.

Among the studies which found a positive relationship between land security and agricultural productivity, we can mention the work of Goldstrein & Udry (2008) who analysed the relationship between land rights and agricultural investments in Ghana. The results of their research show that individuals who have a comfortable position in the political hierarchy benefit from greater land security and invest more to increase soil fertility. In the same country, the study of Abdulai et al. (2011) concludes that land security has a positive effect on productivity. They also empirically proved the positive link between land security, investment and productivity using detailed plot-level data in Ghana.

Niee et al. (2015) are interested in the impact of land tenure security on the productivity of Cameroonian household farms. The authors found that land tenure security significantly affects the investment decisions of agricultural households and, by extension, their productivity. However, holding legal and customary rights increases the probability of acquiring modern equipment by 35 % and 47 % respectively compared to households in free occupation. This equipment in turn determines the level of productivity of farmers.

Melesse & Bulte (2015) focus on the impact on agricultural productivity of the land titling program in Ethiopia. Through the mean propensity score matching method on data collected from 325 household farms in Womberma, Bure, and Jabitehinan districts, they observe a positive effect of land titling on farmers' productivity because of the security and assurance provided by the title. According to them, security of tenure has enabled producers to invest more and adopt soil fertility management strategies. Security of tenure is an incentive mechanism for producers to invest more, which in turn boosts agricultural productivity.

The relationship between land tenure and agricultural productivity in Panama was studied by Cordoba (2017). Using a fixed-effects approach on district-level panel data from 1990 to 2010 compiled by the National Institute of Statistics and Census of Panama (INEC), it finds that land titling has a positive impact on rice yields in agricultural labour-intensive districts, but has no impact in low agricultural labour-intensive districts. Using household level data, the results of this work reveal that households with land titles are more likely to obtain an agricultural loan and invest in the medium and long term in land resources resulting in a boosting in agricultural productivity.

Lawry et al. (2017) conducted a systematic review on the effects of land tenure recognition interventions on agricultural productivity, income, investment and other relevant outcomes. Their findings indicate substantial productivity and income gains from land tenure recognition. According to the authors, these effects may operate through gains perceived in tenure security and investment.

Chen (2017) found that in poor countries, economies with higher percentages of untitled land have low agricultural productivity and that titling can increase agricultural productivity by up to 82.5 %. In contrast, the results of other studies conclude that there

is no effect of land security on agricultural productivity, such as Migot-Adholla et al (1991), Place & Hazell (1993), Place & Otsuka (2002), Bellemare (2013), Chankrajang (2015). Thus, Place & Hazell (1993) by examine the implications of traditional land tenure systems on agricultural productivity in sub-Saharan Africa using the available data for three countries: Ghana, Kenya and Rwanda, find that, with few exceptions, land tenure has no significant effect on investment, land management, input use and access to credit. This result would reflect the fact that land rights have no effect on agricultural productivity.

In this same logic, Migot-Adholla et al. (1991) show through their study that although traditional institutions have progressively evolved in sub-Saharan Africa from a system of collective rights to a system of individual rights, they do not constitute a serious constraint on agricultural productivity. According to them, other factors such as the level of technology, access to credit, the price of products and inputs, and the market situation would be more decisive for agricultural productivity.

Bellemare (2013), investigates the impact of formal and informal land rights on rice productivity in Madagascar. Using Ordinary Least Squares (OLS) econometric methods, instrumental variables and a fixed-effect approach on data from 516 plots belonging to 300 randomly selected households in 17 randomly selected villages, he finds that land title has no effect on productivity, but informal property rights have a heterogeneous effect on agricultural productivity.

Place & Otsuka (2002), in the case of Uganda, study the impacts of land tenure on investment and agricultural productivity. Using a combination of Tobit and Probit models on farm household and plot level data, they show that land tenure does not affect agricultural productivity.

Chankrajang (2015), in the case of Thailand, studies the relationship between land tenure security through partial property rights and agricultural yields. Using the instrumental variable method on a data set of 14.000 Thai farm households from four waves of surveys conducted by the Office of Agricultural Economics in 2002 and 2005, he finds no effect of secure land rights on agricultural productivity. This result is not surprising because of the restriction on property rights.

Singirankabo & Ertsen (2002) using 85 studies in developing countries find that there is no empirical evidence to support the claim that land registration increases agricultural investments and productivity.

This review of the empirical literature shows that the effect of land tenure security and agricultural productivity is mixed, not only because of the divergent and contradictory results, but also because the link between land tenure security and agricultural productivity is not direct but is the result of several other factors. The results appear to have been influenced by the analytical models. Many of the models used have not taken into account the indirect nature of the effect of land tenure security on productivity. This study attempts to correct this shortcoming.

Materials and methods. This section presents the theoretical, empirical frameworks and the data source. *1. Theoretical framework.* One hypothesis of the

evolutionary theory of property rights states that the enjoyment of an exclusive, durable and transferable property right to land encourages the farmer to invest more in the short and long term, in order to reap all the benefits that could be derived from good management of this resource (Goldstein et al., 2018). Thus, land security increases agricultural productivity through investment incentives, land market efficiency, lower transaction costs and improved access to formal credit (Platteau, 1996). Since the security of land rights guarantees Togolese agricultural producers that they will be able to reap all the benefits that can be derived from good management of this land resource, they are thus encouraged to make productive investments in the short and long term (Feder, 1988).

However, the granting of land titles to agricultural producers reinforces their sense of security over the land they farm and increases their ability to use the land as collateral to obtain formal credit (Platteau, 1996) in order to make productive investments. The theoretical relationship between land security and agricultural productivity has been formalized by (Feder, 1988) and Place & Hazell (1993). These authors include in their model the probability that some farmers will be pushed out of the agricultural production circuit because of the risks associated with land. It should be noted that the relationship between land security and agricultural productivity is not systematic, and that it involves investments by agricultural producers for the purchase of modern equipment (tractors, power tillers, harvesters, threshers, etc.) and inputs (fertilizers, plant protection products, improved seeds, etc.). This relationship takes place in three stages: (i) access to land title provides opportunities for farmers to use land as collateral to obtain formal credit; (ii) secondly, credit will encourage farmers to make investment in the purchase of variable inputs (improved seeds, fertilizers, plant protection products, pesticides) and in capital accumulation through the acquisition of machinery, tractors, etc; (iii) finally, investment will enable farmers to intensify agricultural activities and improve agricultural productivity.

Taking inspiration from Place & Hazell (1993), we formulate the following model which is a recursive system:

$$C = f(X, LS), \tag{1}$$

$$I = f(X, LS, C), \tag{2}$$

$$Y = f(X, I). \tag{3}$$

2. Empirical approach. To assess the effect of land title security on agricultural investment and productivity in Togo, we modify the model of Place & Hazell (1993) by introducing in the empirical model the variable Credit as determinant of Investment. The modified model is presented as follows:

$$I = f(X, LS, C), \tag{4}$$

$$Y = f(X, I), \tag{5}$$

where I = investment in the agricultural production;

LS = land security;

Y = agricultural productivity;

C = credit;

X = a vector of control variables including the characteristics of farmers and their plots.

The introduction of this vector avoids a possible endogeneity bias caused by the unobservable heterogeneity of farmers.

Equation (4) describes the relationship between security of tenure and agricultural investment. Security of tenure enhances landowners' sense of security by making them better managers of the land and more willing to invest in it. This equation corresponds to a binary choice model. Indeed, the farm investment variable is an indicator variable expressing the probability of a farmer to invest or not in the acquisition of modern equipment. A Probit would be appropriate for estimating this equation (Amemiya, 1978).

Equation (5) is the productivity equation that is considered typical of a Cobb Douglas production function describing the production process.

The study data do not allow to precisely enumerate all the land rights available to farmers. Nevertheless, it is possible to release three categories of farmers' land status corresponding to a combination of rights and a specific degree of tenure security. The three categories are following:

1. Legal ownership: this category corresponds to farmers who own and have a legal land title owned by the household. This category is assumed to confer the highest level of security, in accordance with the theory of property rights. Farming households here endowed with a various range of land rights since they are owners of the land they farm. They are also assumed to have the right to transfer since the land title gives them at least from a legal point of view the right to legally transfer their property rights;

2. Customary ownership: Here are classified households that own land but do not own no legal title, it is customary property. Classified households in this category are assumed to have a lower level of security than legal owners. The right of transfer is limited since the household does not have a legal title. Transfers of ownership here cannot take place legally;

3. Free occupation: these are households who exploit land that does not belong to them. The households corresponding to this category are therefore potentially in land insecurity since they can, without any recourse, be ousted at any time.

3. *The estimation technique.* To estimate the system of simultaneous equations (4) and (5), it becomes necessary to use an instrumental variable regression model which is estimated by 2SLS. The problem with this approach relies on the choice of instruments. It is important to use selection instruments, i.e. variables that directly affect the choice of investment (equation 4) but not the productivity (5). In this article, we assume the credit variable as a good instrument of selection of the productivity function. The validity of this instrument is tested by performing a simple test: if this variable is a valid selection instrument, it will affect the investment decision but will not affect the productivity. Table 1 shows the definitions and measures of the variables.

Table 1

Definitions and measures of the main variables

The variables	Definition and measures of variables
Productivity (kg/ha)	Stands for agricultural productivity. It is measured by dividing the total value of production by the individual area farmed in hectares. We used the Natural Logarithm of PRODUCTIVITY.
Investment	Stands for investment. It is a binary variable that takes 1 if the farmer has invested in the purchase of inputs and equipment and 0 otherwise.
Land_security	Stands for land security. It is a categorical variable that takes three forms: legal ownership (title), customary ownership, and free occupation.
Age	Stands for age of the farmer. This variable also allows to capture the farmer's experience in agriculture and his motivation to adopt or not new technologies and farming practices. We used the Natural Logarithm of AGE.
Gender	Stands for gender of the farmer. It is a binary variable that takes 1 if the farmer is a woman and 0 otherwise.
Education	Stands for education level. It is Dummy variable = 1 if the farmer has a level of education at least equal to the first class of college and 0 otherwise.
Labour	Number of active persons who work in a farmer's exploitation. We used the Natural Logarithm of LABOUR.
Farm_size (ha)	Stands for the farm size. It is the size of the area farmed in hectares. We used the Natural Logarithm of FARM_SIZE.
Access_credit (USD)	Stands for the access to credit. This variable is measured by the amount in US dollars of credit actually received by the farmer following his application. We used the Natural Logarithm of ACCESS_CREDIT.
Main_activity	Stands for the main activity. It is a binary variable which takes the value 1 if the main activity of the holder is exclusively agriculture and 0 otherwise

Source: authors' research.

4. *Data source.* The data used in this study come from the fourth national census of agriculture conducted over the period 2013–2014 by the department of agriculture Ministry in charge of statistics (DSID). The study covers 26550 heads of agricultural households extracted from the DSID's database.

Results and discussion. We first present the descriptive statistics then the econometrics results before discussing the results.

Presentation of descriptive statistics. Table 2 provides all the descriptive statistics of the variables used in the study according to land status. It seems that customary institutions still occupy a preponderant place in the rural communities. Households with customary rights represent 64 % of the sample. The land title remains unknown for most households which refer to customary institutions. Only 6 % of households hold at least one land title on the land they farm. Free occupation represents 30 % of the sample, a significant proportion which once again indicates the constraints related to access to land ownership. The table shows that access to land ownership is more restrictive for women. Indeed, the proportion of female heads of household (68 %) is

higher among households in free occupation compared to other categories.

Legal landlords are more productive than other categories of farmers. Their farm size is higher, they also have easier access to credit. On average, they devote more resources to the purchase of inputs and equipment. The proportion of household heads with more than the first class in college is 59 %, i.e. it is respectively 23 % and 48 % for customary owners and those in free occupation. However, in terms of long-term investments, the proportion of households with modern equipment is higher for customary owners (17 %) than for legal owners (13 %) and for households in free occupation (9 %). This could indicate that customary owners have much incentives to invest than legal owners. This could be due to the cumbersome procedures for legalizing land ownership and the fragility of legal land institutions.

Table 2

Descriptive statistics of the main variables

Indicators	Legal ownership (title)	Customary property	Free occupation	Total
Rights prevalence	0.06 (0.02)	0.64 (0.03)	0.30 (0.10)	100 (0.00)
Investment	0.13 (0.02)	0.17 (0.12)	0.09 (0.03)	0.15 (0.01)
Productivity	1204 (21.23)	865 (12.27)	775 (9.75)	956 (4.22)
Gender	0.18 (0.09)	0.37 (0.07)	0.68 (0.07)	0.46 (0.00)
Age	41.00 (3.08)	39.00 (9.34)	34.00 (2.53)	38.00 (5.51)
Main_activity	0.87 (0.05)	0.89 (0.09)	0.83 (0.09)	0.96 (0.07)
Farm_size	2.93 (0.54)	1.41 (0.71)	0.98 (0.06)	0.97 (0.23)
Education	0.59 (0.09)	0.23 (0.08)	0.48 (0.07)	0.47 (0.35)
Labor	5.21 (2.05)	5,34 (3.16)	4.45 (2.57)	5.07 (1.78)
Access_credit	225 (0.04)	124 (0.00)	76 (0.05)	98 (0.06)

Note. Values out and in the parentheses are mean values and standard deviation respectively.

Source: authors' calculation from the agricultural national census data.

Presentation of econometric results. The link between land security and agricultural investment and productivity through a recursive system of equations is estimated. The results of the estimation of this system using instrumental variable regression is presented in Table 3 below.

Column 2 of this Table presents the results from the equation for investment (equation 4). Being a binary choice model, the estimation of the marginal effects of this equation was used in this analysis and the marginal effects are presented in column 3. It appears that land tenure security has a positive effect on the probability of

purchasing inputs and equipment. The indicator variables of legal ownership and customary ownership are significant and have a positive effect on investment, that is to say, in the acquisition of inputs and modern production equipment. The marginal effects indicate an expected effect on the probability of purchasing inputs and equipment equal to 0.13 and 0.21 respectively for the legal and customary rights.

Table 3

Econometric estimations results

Indicators	Investments (4)	Marginal effects (4)	Agricultural productivity (5)
Legal (ref: Free occupation)	0.483** (0.043)	0.132** (0.020)	-
Customary (ref: Free occupation)	0.521*** (0.001)	0.210*** (0.004)	-
Investment	-	-	0.340*** (0.001)
Gender	-0.386** (0.048)	-0.023*** (0.004)	-0.191* (0.090)
Age	-0.426*** (0.001)	-0.067*** (0.005)	-1.684*** (0.002)
Age ²	0.056*** (0.008)	0.003*** (0.009)	0.520*** (0.001)
Main activity	0.159 (0.32)	0.010 (0.60)	0.208*** (0.005)
Farm size	0.146** (0.024)	0.029*** (0.002)	0.816*** (0.003)
Labour	0.154 (0.31)	0.020 (0.30)	0.208*** (0.003)
Education	0.197 (0.307)	0.012 (0.204)	0.571** (0.031)
Access credit	1.280** (0.043)	0.211** (0.047)	-
Constant	198.605 (0.456)	23.05 (32.09)	0.765*** (0.004)
Wald / F-stat.	Wald chi2=115	-	F-stat =182
Probability	0.00	-	0.00
Number of observations	26550	-	26550

Note. *** p<0.01, ** p<0.05, * p<0.1; p values in parentheses. – means no value in the cell.

Source: authors' estimation from the agricultural national census data.

The variable access to credit by the farmer, positively and significantly affects investment and this can be explained by the low purchasing power of smallholders. This result corroborates that of Agbodji & Johnson (2021) who showed that access to credit, had a positive and significant impact on the productivity of certain cereals crops in Togo.

The variable farm size also positively and significantly affects the propensity to acquire inputs and equipment. Indeed, large cultivated areas often require abundant labour and high capital for farming. The variable education does not seem to affect the

decision to invest. The negative sign associated with the age of the household head is consistent with the stylized facts that older farmers are more reluctant to adopt new technologies. For the sex of the head of household variable, the coefficient is negative and significant at the 1 % level confirms the constraining nature of access to land for women, most of them being in free occupation.

Equation (5) provides the factors affecting the agricultural productivity, mainly the investment and labour. It appears that investments in the purchase of inputs and modern equipment have a positive effect on the productivity of Togolese farmers (column 4). This result confirms the evolutionary theory of property rights according to which land security has a positive effect on agricultural productivity through investment incentives especially in the purchase of variable inputs and modern production equipment.

Agricultural productivity in Togo is also explained by some characteristics of the farmers namely the education level, the gender and the main activity of the farmer. In particular, if the main activity of the farmer is exclusively agriculture, this has a significant positive influence on agricultural productivity. This could be explained by the fact that if the main activity of the farmer is exclusively agriculture, he would invest all his time and financial resources in improving soil quality in order to be able to reap the fruits of his efforts at the end of each agricultural season.

In summary, the factors that explain agricultural productivity in Togo can be classified in two categories: the indirect factors which are legal and customary land ownership and the direct factors which are investments in the purchase of inputs and equipment and some characteristics of the farmers like access to credit, education and farm size.

The results show, as expected, that land title security positively affects agricultural productivity by increasing incentives for agricultural households to invest. The study shows that, compared to households with land insecurity (in free occupation), households with land title are more inclined to acquire inputs and equipment for their farms. This result can be explained by the fact that these households are more reassured that they could benefit from the fruits of their investments. These results are compatible with those of Cordoba (2017), Lawry et al. (2017), Chen (2017) and Melesse & Bulte (2015).

However, the study raises another aspect which might at first seem contradictory. While one would expect, as postulated by property rights theory that households with legal rights secured by land titles would feel more secure than households with customary rights this does not appear to be the case in Togo. In most cases, customary property rights are enough for farmers to feel secure, especially since obtaining a land title can take several months. Additionally, in some areas, property is passed down as a family heirloom. The beneficiaries include it as part of their assets even if they do not have legal rights. According to them, they can therefore invest in these properties without risk. This result is consistent with some theoretical literature that contests the idea that land title is a condition to guarantee the security of farmers (Singirankabo &

Ertsen, 2020). Place & Hazell (1993) in their studies on “indigenous” tenure systems already showed that these did not constitute a real constraint for agricultural productivity. But even better, the Togolese context itself helps to explain these results. Customary law still serves as a reference for households who consider registration procedures to be long, paid for and simply ignore them.

Households, therefore, still essentially refer to local habits and customs that are accepted by their entire community. In addition, and this is undoubtedly the most determining factor, the prevailing corruption in the land sector reduces the benefits in terms of security that can be expected from the possession of a land title. Households only decide to acquire securities if the benefits they derive from them will be greater than the costs incurred. However, corruption weighs negatively the gains expected from the registration procedure. This then explains why so few agricultural households in Togo hold land titles. Corruption plagues land tenure institutions, especially those responsible for arbitration in the event of a conflict, which diminishes the interest of households in resorting to them. False titles are issued, sometimes several for the same plot. Corruption seriously plagues land tenure and the country’s legal land institutions therefore must struggle to ensure land tenure security for households.

Conclusions. Since 2018, Togolese government has adopted a land code recognizing the land title as the main guarantee of land security likely to stimulate more agricultural investment and productivity. The objective of this paper is to assess the effect of land title security on agricultural productivity in Togo. To do this, a recursive system of equations was used to analyse the relationship between land tile security and agricultural productivity in Togo. The estimation of this recursive model by the instrumental variable regression method allowed to have convincing results and to draw more interesting conclusions. The results reveal that, land tenure security has a positive effect on investment. However, the probability that farmers will devote financial resources to the acquisition of production inputs and equipment is higher when the land used by the farmer is customarily and legally secured. Contrary to what is expected, these probabilities are respectively 21 % for holding land customary rights and 13 % for holding titles. This result shows that in Togo, investments in the purchase of inputs and production equipment depends on the land security status of the farmers. These two types of investments in turn improve the productivity of the farmers.

Therefore, it appears that the effect of security on productivity is not direct, it uses investments in inputs and equipment as transmission channels. The recursive model estimated by instrumental variable regression approach appeared appropriated to understand the effect of land security on the agricultural productivity in Togo. Moreover, the results seem to indicate that legal land institutions do not protect the security of land tenure better than traditional institutions. Public authorities must therefore recognize that local rights are as efficient as legal rights. In other words, they must adapt the institutional supply to the rural context and struggle against corruption in order to create the conditions for a real improvement of agricultural productivity in Togo.

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