THE INTERACTION BETWEEN LAND TENURE SECURITY AND AGRICULTURAL PRODUCTIVITY IN ZIMBABWE[1]

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This paper investigates the relationship between land tenure security and credit use, investments in land improvements and complementary short-term input use, and yields in small scale agriculture. Data for the study were gathered by means of a survey interview of farmers in the Small Scale Commercial Sector, Resettlement Areas and Communal Areas of Zimbabwe. Descriptive statistics indicate that investments in land improvements and short term input use is greatest in areas where tenure is most secure. Households lacking exclusive and assured land rights have little incentive to invest in agriculture. However, little evidence supporting the benefits of land titling is provided.

DIE INTERAKSIE TUSSEN GRONBESITSEKERHEID EN LANDBOUPRODUKTIWITEIT IN ZIMBABWE
Hierdie referaat ondersoek die verhouding tussen grondbesitsekerheid en kredietgebruik, belegging in grondverbeterings en gepaardgaande korttermyn-insetgebruik en opbrengste in kleinskaalse landbou. Data vir die navorsing is ingesamel deur middel van 'n opname oor boere in die Kleinskaal Kommersiëlesektor, Hervestigingsgebiede en Gemeenskapsgebiede van Zimbabwe. Beskrywende statistiek dui aan dat beleggings in grondverbeterings en korttermyn-insetgebruik die grootste is in gebiede waar besitreg die sekerste is. Daarenteen het huishoudings wat uitsluitlike en versekerde grondbesit kort, min aansporing om in die landbou te belê. Min bewyse wat die voordele van besitregverlening ondersteun, word egter verskaf.

1. Introduction

Issues relating to land and tenure reform in Southern African countries have attracted considerable research recently following increasing attention to the development of the small scale agricultural sector. Despite this, the land tenure debate is regarded as sensitive and somewhat controversial, since some argue strongly for communal ownership (Bromley, 1989; 1994; Van den Brink, 1994), others for individual ownership (Feder & Norohna, 1987; Feder & Onchan, 1987) while others contend that land tenure has limited impact on productivity and investment (Place and Hazell, 1993).

This issue, nonetheless, is of great importance to agricultural production in South Africa. Research in KwaZulu-Natal indicates that market failure has resulted in communal areas as there is no opportunity cost to penalize the non-use of land, and externalities (both positive and negative) are not internalized because of the free-rider problem. Additionally, it is argued that any land reform programme which takes land out of commercial production under formal private tenure, and resettles it under a land tenure institution which does not facilitate economic interaction or adequately internalize externalities, will reduce the level of agricultural production and conservation on that land.

The hypothesis to be investigated in this paper is that land tenure security affects both investment incentives and the availability of resources to finance investment in land. Section 2 provides an overview of recent research into land tenure issues in Southern Africa. Section 3 details the choice of study area and the collection of data used in the study while Section 4 and 5 describe aspects of land tenure security on both arable and grazing land in the chosen areas. Credit use, on-farm investments, input use and yields observed in the sample are reported in Section 6, and concluding comments are presented in Section 7.

2. Tenure security and agricultural productivity

A commonly held view amongst development specialists is that land tenure reform is a precondition for economic development. Traditional communal tenure is often regarded as inefficient since land is assigned zero opportunity cost even in conditions of land scarcity, resulting in inefficient resource allocation (Nieuwoudt, 1990). By way of contrast, individual ownership (most commonly demarcation and registration by means of freehold title) is often viewed as a superior tenure system (Barrows & Roth, 1990). According to Feder & Noronha (1987), the evolution of permanent and enforceable land rights increases tenure security and is closely related to advances in farming technology and efficient recourse allocation, *provided* the land registration system is effective and governments ensure that land rights are enforceable.

Arising from this are several specific hypotheses regarding economic behaviour. Compared with weak or insufficient property rights, individualized rights based on economic theory are believed to, firstly, increase tenure security thereby facilitating the evolution of a land market by increasing the certainty of contracts and lowering enforcement costs. Such a land market promotes efficient land use as an opportunity cost is imposed on the non-use or under-use of land (Nieuwoudt, 1990). Secondly, secure tenure is expected to encourage greater on-farm investments and short-term complementary input use as the benefits of such investment are to a large degree internalized, either in use or upon alienation (Feder & Onchan, 1987). Finally, secure tenure and a well functioning land market allows the individual to use the land as collateral, increasing his/her ability to invest in the land (Pasour, 1990:202).

However, limited neoclassical theory predicting that individualized tenure will increase tenure security appears

inadequate in explaining the results of titling programmes in Africa (Barrows & Roth, 1990). Analysis of survey data from Kenya, Ghana and Rwanda did not reveal any significant relationship between farm productivity and "complete" transfer rights to land (Place & Hazell, 1993). In Kenya, the expected gains in agricultural productivity and resource management did not materialize following a land registration programme in the 1950's (Barrows & Roth, 1990).

As an alternative, Place *et al* (1994: 19) define tenure security as a function of three components, viz. breadth, duration and assurance of property rights, with legal and economic dimensions. The breadth, or robustness, of rights defines the legal quantity or bundle of rights held over the land (use, transfer and exclusion rights). The duration is the length of time during which the bundle of rights is legally valid. Investments require that the time horizon be sufficiently long to enable the land holder to recoup with confidence economic returns accruing to the investment. Assurance defines the certainty with which legal definitions of breadth and duration are held. If legal procedures to settle property rights disputes are vague, or their outcomes uncertain, tenure is insecure. From an economic perspective, if any one of these conditions is lacking, tenure is not secure (Lyne and Roth, 1994).

3. Data collection

Data for this study were gathered by means of a survey interview of small scale farmers in Zimbabwe, during April 1995. The study area was stratified according to different tenure characteristics. Three strata were identified, namely the Small Scale Commercial Sector (SSCS), the Model A Resettlement Area (RA) and the Communal Area (CA). Within each stratum, a simple random sample of the sampling unit (the household) was drawn and the household head interviewed. A sample of 119 respondents was recorded, 40 from the SSCS, 39 from the RA and 40 from the CA.

4. Land tenure security: arable land

4.1 Land tenure in the small scale commercial sector

The SSCS accounts for only 3,6 per cent of Zimbabwe's land area. The average farm size is 132,7 hectares, with 16 hectares of arable land. In the SSCS, land is initially held under a long-term lease from the government with an option to purchase. Once this option has been exercised, individuals are granted freehold title to the land and can enter into land transactions.

Statistics describing tenure characteristics are presented in Table 1. Although freehold tenure grants an individual exclusive land rights, *de facto* individual rights in the SSCS vary considerably. Firstly, of the 40 SSCS farmers interviewed, 28 (70 per cent) had title deeds to their land. However, in only 17 cases was the title deed registered in the current household heads name. In the remaining 11 titled cases, the title deeds remain registered to deceased persons as heirs failed to register the change of ownership, owing to high transaction costs. Secondly, while approximately 95 percent of all SSCS farmers indicated that they are able to specify the heir to their land, only 47.5 per cent believe they have the right to sell their land without the permission of the government. Of the 40 respondents, 24 acquired their land by means of a land transfer. Of these, 22 were by means of inheritance, with only 2 land purchases being recorded.

Although 57,5 per cent of all SSCS households reported crop losses following cattle intrusions, 22 per cent of affected households received compensation for their losses. All of the court imposed fines were enforced, increasing the certainty of law and tenure assurance in the SSCS. The remaining 78 per cent settled out of court, and did not demand compensation. Households with registered title deeds had greater breadth of property rights and reported a lower incidence of stray cattle and crop losses compared to those without registered title deeds.

4.2 Land tenure in the Resettlement Area (Model A : Intensive resettlement)

The Model A (Intensive) resettlement model accounts for 78,7 per cent of the total number of people resettled from 1980 to 1990. Land in the resettlement area is owned by the government, and settlers are issued an annual (and conditional) permit to cultivate five hectares of arable land, plus access to common grazing.

The breadth of rights over arable land in the RA is limited Households are not allowed to sell their allotted land. Only 74,4 per cent of respondents indicated that they can specify.

Table 1: Tenure characteristics on arable land in the SSCS, RA and CA of Zimbabwe, 1995

	SSCS (40)	SSCS[1] (17)	SSCS[2] (23)	RA (39)	CA (40)
Breadth of property rights (%):					
Right to sell	48	65	35	3	5
Right to bequeath	95	94	96	74	100
Right to exclude livestock in winter	98	100	96	3	2
Assurance of property rights (%):					
Incidence of stray livestock at planting	48	35	57	82	85
Incidence of crop damage by stray livestock	58	47	65	82	60
Settled out of court (with compensation)	13	0	20	8	0
Stock owner fined in court	9	13	7	6	0
Fine not paid	0	0	0	3	0
Took no action against stock owner	0	0	0	25	4

1 Title deed is registered in the current household heads name.
2 No title deed or title deed is registered in previous household heads name.

the heir to their land. Over 97 per cent of households indicated that they did not have the right to exclude stock owners from their arable lands during winter. Moreover, exclusive arable rights are difficult to enforce. Eighty two per cent of households reported stray livestock in their fields at the time of planting. The same number of households reported crop losses due to stray livestock. Eight per cent of these respondents received out of court compensation. Only two household reported the stock owner to the government authorities (resettlement officer). In both cases the stock owners were fined, but one of the fines was not enforced. Approximately 25 per cent of affected households took no action against stock owners. A possible reasons for this is that allotted arable lands are far from the house (average distance is 1,03 km), and it is therefore difficult to identify the guilty stock owner.

4.3 Land tenure in the Communal Area

Title to land in Communal Areas is vested in the State. As long as the family resides in the area, communal ownership confers individual rights to plots for houses and arable land, and provides unlimited access to communal grazing land held by the community. The average farm size reported was 3,57 hectares.

Individuals do not have the right to buy or sell land in the CA, while the right to bequeath arable land was reported by 100 per cent of households interviewed. On allotted arable land, 98 per cent of respondents indicated that they did not have the right to exclude stock owners from their land during winter. As in the RA, exclusive rights to arable land are difficult to enforce, with 85 per cent of households interviewed reporting cattle intrusions at the time of planting. During discussions with extension officials and farmers, late planting was identified as a major constraint on production in the Communal Area. Sixty per cent of respondents reported crop losses due to stray cattle. Of importance is that no farmers were compensated for their losses. No stock owners were reported to the tribal authorities. Only one farmer demanded out of court compensation for crop damage, but the stock owner refused to pay. Most farmers indicated an unwillingness to report crop losses for fear of retribution should their cattle stray the following season, with 92 per cent of affected respondents choosing to settled out of court without compensation.

5. Land tenure security: grazing land

The situation on grazing land is even more extreme than that found on arable land in the small scale sector in Zimbabwe. In the SSCS, individual rights to grazing land are exclusive and enforceable. Although 62,5 per cent of households reported having problems with stray cattle entering their grazing lands, 80 per cent of these chased the cattle away, while one farmer reported the stock owner to the courts and was compensated. Moreover, 95 per cent of households adhered to the correct stocking rates for their farms. By contrast, only 10 per cent of RA farmers, and no CA farmers, were aware of recommended stocking rates or livestock rules. Over 90 per cent of RA and CA farmers reported stray livestock from other villages on their allotted communal grazing, but less than 15 per cent did anything to remove the livestock. Thus, although rules do exist to control livestock numbers on communal grazing in the RA and CA, *de facto* communal grazing is an open access resource.

6. The interaction between land tenure security and agricultural productivity

6.1 Land rights and credit use

Economic theory suggests that increased tenure security increases the supply of short-term and longer-term credit as land can be used as collateral to secure loans. Additionally, increased tenure security increases the demand for credit as returns from investments accrue to the operator (Blarel, 1994: 83).

In the sample, no relationship was discernable between tenure security and the supply of short-term and medium-term credit to the SSCS, RA and CA, which is consistent with other studies in Africa (see Bruce *et al*, 1994: 254). This is because government guaranteed Agricultural Finance Corporation (AFC) production loans are available to all farmers in the study region, and while land is preferred as collateral in the SSCS, it is not required as collateral in the RA and CA. Use of AFC loans was reported by 10 per cent of SSCS farmers, 26 per cent of RA farmers and 12.5 per cent of CA farmers. The insistence that SSCS farmers pledge land as collateral acts as a disincentive to credit use. While 72 per cent of SSCS farmers not using credit indicated that they would like to, 70 per cent of these farmers felt that the risk of dispossession following loan default was too great. No farmers in the survey used credit from commercial banking institutions.

Discussions with AFC officials revealed that successful RA and CA applicants were chosen on the strength of their repayment capacity, rather than their available collateral. Consequently, there is a strong correlation between credit use and farm size, and credit use and gross farm income ($r=0{,}4643^{**}$ and $0{,}9183^{**}$ respectively). Reasons for this are twofold. Firstly, larger farmers are more creditworthy by virtue of their larger gross farm incomes, increasing the supply of credit. Secondly, larger farmers have increased investment incentives as costs are spread over a larger output, increasing the demand for longer-term financing.

6.2 Land rights and land improvements

Information on the incidence of 8 types of land improvements made since acquisition was collected from each household interviewed. These data were combined into investments in livestock production (fencing and establishing pastures), investments in crop production (soil liming and fencing arable lands), long-term land improvements (conservation measures and establishing tree crops) and investments in farm buildings and housing (Table 2).

The expected theoretical relationship was found to be strong. Households with more secure property rights (SSCS farmers) invested more in all land improvements than those with less secure rights (CA and RA farmers). Moreover, investments in long-term land improvements (tree crops and conservation) were markedly higher in the CA than in the RA, presumably because of the greater breadth of property rights in the CA (greater right to bequeath land). Fifty per cent of CA farmers had planted tree crops, compared with only 8 per cent of RA farmers. Investments in land conservation was common in all strata, in line with strict conservation legislation on arable land.

Table 2: Land improvements in the SSCS, RA and CA of Zimbabwe, 1995

	SSCS (40)	RA (39)	CA (40)
Livestock Investments (%):			
fencing	90	0	0
pastures	58	3	0
Arable Investments (%):			
fencing	90	41	28
liming	15	5	5
Land Investments (%):			
tree crops	90	8	50
conservation	93	53	58

Investments in livestock production is greatest in areas having exclusive grazing rights. Over 90 per cent of SSCS farmers erected cattle fences in there grazing lands, and 58.5 per cent had established pastures or hay crops. Due to the unrestricted access to the communal grazing in the RA and CA, less than 3 per cent of RA and no CA farmers planted pastures. Even on arable land, RA and CA households do not have the incentive to establish pastures for livestock, as arable land reverts to communal grazing in winter. It is striking that 44 per cent of the cattle herd in the CA and 30 per cent of the herd in the RA died as a result of fodder shortages in the 1992 drought, compared to only 22 per cent in the SSCS.

6.3 Land rights, input use and agricultural productivity

Statistics describing farm production characteristics for the 1993-1994 agricultural season are presented in Table 3. For short term input use, tenure security is likely to be less of an issue as benefits can be captured by the operator at the end of the season. The survey revealed that over 90 per cent of all households interviewed purchased short-term inputs (fertilizer and seed). Crop expenditure and yields per hectare are greatest in the RA, suggesting that temporary occupation permits provide sufficient incentives to invest in short term inputs. However, the influence of agricultural potential on investment incentives and yield cannot be ignored. While over 95 per cent of SSCS farmers and all CA farmers are situated Natural Region 4, identified as a semi-extensive farming region not suited to crop production, 82 per cent of RA farmers are situated in regions suited to crop production (Natural Region 2 and 3). Moreover, 87 per cent of households in the RA have sandy clay soils, well suited to maize production. By contrast, more than 72 per cent of SSCS and CA farmers are on low potential sandy soils.

The influence of tenure security on input use and yield is best demonstrated by comparing the SSCS to the CA. The inability to enforce exclusive rights to arable land and claim compensation for crop losses in the CA acts as a disincentive to investments in short-term inputs and prevents timeous planting. Although agricultural potential is similar in the two regions, farmers in the SSCS invest 25 per cent more in short-term inputs (fertilizer per hectare), and achieve more than twice the CA yield.

Expenditure on veterinary supplies per livestock unit averaged Z$14,34 in the SSCS, compared to only Z$3,03 and Z$8,07 in the RA and CA respectively. Although herd sizes were larger on SSCS farms, cattle sales were considerably higher than on RA and CA farms. This is to be expected since grazing is common property in the latter cases and there is little incentive for users to keep cattle for purposes other than as a store of wealth. Livestock ownership is also highly concentrated in the RA and CA. While only 12,5 per cent of SSCS farmers have less than 5 head of cattle, this was reported by 28 per cent of RA and 67 per cent of CA farmers. Consequently, 34 per cent of CA farmers did not plant all of their arable allotment owing to a

Table 3: Mean characteristics of SSCS, RA and CA farmers in Zimbabwe, 1993-1994

	SSCS (40)	RA (39)	CA (40)
Natural Region[1] (NR)	3,95	2,95	4
Soil type[2]	1,85	3,6	2,13
Area planted (ha)	8,99	3,55	3,00
Percentage of total area planted (%)	57	72	84
Crop production:			
Kg fertilizer/hectare (kg)	129,74	115,75	97,47
Crop expenditure/hectare (Z$)	235,93	250,90	203,24
Maize yield/hectare (Z$)	2158,00	2603,14	978,69
Crop income/hectare (Z$)	1480,55	1621,19	414,55
Hired inputs/hectare (Z$)	175,31	42,57	27,20
Livestock production:			
Herd size	16	13	5
Vet expenditure/LU (Z$)	14,34	3,03	8,07
Cattle sales (Z$)	2167,25	1438,72	577,00

[1] NR2 Intensive farming region; NR3 Semi-intensive farming region; NR4 Semi-extensive farming region.
[2] 1 sandy soil; 2 sandy loam; 3 sandy clay loam; 4 sandy clay; 5 clay.

lack of draught power, compared to only 10 per cent in the SSCS.

7. Conclusions

Great caution is required when drawing inferences based on mean comparisons, as this can lead to spurious conclusions. However, the descriptive statistics do provide some evidence supporting the proposed hypotheses. On arable land, farmers invested more in all land improvements in areas having greater tenure security (breadth, duration and assurance of rights). Where land rights are not transferable (through sale or inheritance), the lowest levels of long-term land investments were reported (in the RA). Moreover, despite differences in agricultural potential, the data suggest that increased tenure security has a positive impact on investments in short-term inputs and yield. On grazing land the situation is more striking. Unrestricted access to common grazing greatly reduces individual incentives to invest in livestock production in the RA and CA.

Owing to institutional constraints, the benefits of land titling are not apparent in the study. The supply side effect of title on credit observed elsewhere (Feder and Onchan, 1987) were not forthcoming the small scale sector of Zimbabwe. Also, long-term land improvements appear equally prevalent on titled and untitled land in the SSCS. This is because, land titling in the SSCS of Zimbabwe has been characterised by a failure of households to register transfers and succession. Land title is thus not exclusive in the SSCS, as a result of social customs and traditional family rights becoming intertwined with concepts and practices of owning land in the freehold sense.

Note:

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