Secure land rental contracts and agricultural investment in two communal areas of KwaZulu-Natal

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Abstract

This study tests the hypothesis that an efficient rental market for cropland is a significant determinant of agricultural investment in the communal areas of KwaZulu-Natal. An efficient rental market creates an opportunity cost for under-utilisation, which tends to transfer resources to more effective users. The efficiency of a rental market is compromised by the presence of transaction costs that reduce returns for both lessees and lessors. Transaction costs include risk arising from a possible breach of the rental contract. Potential losses caused by a breach of contract can be reduced by introducing a credible third-party to witness the contract. Likewise, moral hazard can be reduced by contracting with trusted persons. Data from household surveys conducted in two communal areas of KwaZulu-Natal were used to estimate a regression model explaining levels of investment in crop production amongst tenant farmers. The results confirm that tenants invest more when they contract with friends or family, and if their contracts are formally witnessed by a credible third-party. Interventions that reduce potential losses caused by a breach of contract are therefore expected to promote market efficiency and investment in crop production. In the short-run, the Provincial Department of Agriculture should sanction rental contracts negotiated by lessors and lessees. Ultimately, legal reform that leads to predictable contract enforcement in the communal areas is required to improve market efficiency and levels of investment in agriculture.

Key words: Customary institutions, insecure land tenure, rental market, transaction costs, moral hazard, crop production

1. Introduction

South Africa's racially biased pattern of land ownership was formalised in 1913 by the Natives Land Act. This legislation restricted African land 'ownership' to

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native reserves (and later, homelands) where the principal mode of tenure was 'customary' and administered by traditional leaders (Lyne & Darroch, 2003). Today, an estimated 13 million black South Africans reside in these communal areas with 80% living in poverty (Turner & Ibsen, 2000:2). The communal areas of KwaZulu-Natal are characterized by intense population pressure and small farm sizes; rural households import the bulk of their staple foods yet relatively large tracts of cropland are left idle (Crookes & Lyne, 2001). One reason for the under-utilisation of cropland is that there is little or no opportunity cost to penalise non-use. An active rental market for cropland creates an opportunity cost for idle land, which is expected to improve allocative efficiency (Nieuwoudt, 1990). Long-term research conducted in the communal areas of KwaZulu-Natal has shown that (a) rental markets for cropland are constrained by insecure land tenure and high transaction costs (Thomson & Lyne, 1993), (b) rental markets can be developed by adapting customary institutions (Lyne & Thomson, 1998) and (c) active rental markets tend to have both efficiency and equity advantages (Crookes & Lyne, 2003). Crookes & Lyne (2003) found that lessees applied seasonal inputs (fertilizer, seed and chemicals) at more than three times the rate applied by lessors. Lessors were relatively land rich but cash poor.

The aim of this study is to test the hypothesis that an efficient rental market for cropland is a significant determinant of agricultural investment in the communal areas of KwaZulu-Natal. The efficiency of a rental market is compromised by the presence of transaction costs that reduce returns for both lessees and lessors. Transaction costs include risk arising from a breach of the rental contract. In KwaZulu-Natal where enforcement of land rental contracts by traditional courts is uncertain (Lyne & Thomson, 1998), potential losses caused by a breach of contract can be reduced by introducing a credible third-party to witness the contract (Crookes & Lyne, 2001). Moral hazard can also be reduced by contracting with trusted persons. This study treats these attributes as indicators of relatively efficient contracts and combines them with other explanatory variables in a regression model of crop inputs purchased by tenant farmers identified in a survey of rural households drawn from two communal areas of KwaZulu-Natal.

The next section of this paper traces the origins of the study and its data. Section 3 outlines concepts of transaction costs and risk perceptions relevant to the rental market for cropland, and postulates a regression model to test the research hypothesis. Section 4 presents descriptive statistics and regression parameters

estimated from the sample data, and discusses the findings. The paper concludes with policy recommendations.

2. Background to the study and data

This study uses data from a sample survey conducted by a team of staff and students from the University of KwaZulu-Natal in 2003. The survey assessed a programme implemented by Lima Rural Development Foundation (hereafter Lima) in 1999 to promote rental markets for cropland in the communal areas of two target districts, Bergville and Estcourt. Lima had been contracted by USAID/Pretoria to expand a research project undertaken by the University of Natal that showed how customary institutions could be adapted to improve tenure security, reduce transaction costs and create an active rental market for cropland. These adaptive strategies, detailed by Lyne & Thomson (1998), included the endorsement of rental contracts by a credible witness to facilitate contract enforcement in traditional courts. By 2002, Lima had extended the programme into six communal areas within the target districts. The aim of the survey was to examine the efficacy of Lima's programmes in stimulating land rental markets for cropland, and to identify the efficiency and equity impacts of these markets. Households in these rural areas were generally characterized by large family sizes, poor education, high rates of unemployment and very low incomes

The survey was conducted at two sites, one in each district, and included both Lima clients and non-clients. Random samples were drawn from lists of households at each site. For clients, the lists were extracted directly from records maintained by Lima. Non-clients were listed by matching each client with a non-client neighbour identified by Lima staff. A total of 149 household heads were interviewed. Two questionnaires were unusable and scrapped. The remaining 147 respondents were distributed almost equally between the survey sites. The survey was carried out over a period of approximately four months of which 15 days were spent in the field interviewing respondents. A structured questionnaire elicited data on a wide variety of household demographics. Information relevant to this study was extracted from the survey data to estimate the parameters of an OLS regression model formulated to test the research hypothesis. This data subset comprised of 48 cases representing tenant farmers with valid observations on the variables included in the regression analysis.

3. Rental market efficiency and investment in crop production

The following sections outline theoretical relationships between transaction costs, risk perceptions, efficiency in the land rental market and investment in crop production. Indicators of relatively efficient rental transactions are identified and a regression model is postulated to explain levels of seasonal crop inputs applied by (48) tenant farmers in the sample of (147) households.

3.1 Transaction costs and the rental market for cropland

Transaction costs include the costs of defining and enforcing a contract (Randall, 1972:16). It is convenient to classify transaction costs as *ex ante* or *ex post* transaction costs (Williamson, 1985: 20). *Ex ante* transaction costs comprise mainly of fixed costs, which do not vary with volume traded, and arise from the search for and negotiation with potential trade partners. These costs affect the decision to participate in a rental transaction. *Ex post* transaction costs on the other hand, are variable costs that increase with the volume traded and which therefore affect the size of a transaction. Such costs include premiums associated with the risk of losses following a breach of contract. In the absence of integrity and trust, transactions must be monitored and policed and the more that is traded, the more there is to monitor and to be lost (Casson & Wadeson, 1998). Together, *ex ante* and *ex post* transaction costs have the effect of limiting the incidence and size of transactions, i.e. limiting the number of transactions and area of land traded in rental markets, and may even preclude market participation altogether.

Under customary law, a rental contract is sometimes regarded as evidence that the lessor does not need land; exposing the lessor to expropriation by the traditional authority should the lessee claim the land. Some forty per cent of respondents in previous surveys of rural households in KwaZulu claimed that they would lose their land if they rented it to other households (Lyne & Thomson, 1998). Lyne & Thomson (1998) also report that prospective tenants were not convinced that traditional courts would uphold a long-term contract if the lessor decided to terminate the lease early. Respondents mentioned cases where lessors had reclaimed their land after the tenant had improved its fertility. These perceptions of risk inflate *ex post* transaction costs, driving a wedge between the offer price of tenants and the reservation price of lessors. Even if small farmers are not inherently risk averse (Binwanger, 1980), they could behave as if highly risk averse depending on the circumstances under which they operate. Moscardi & de Janvry (1977) found that risk-aversion coefficients estimated for small

farmers in Mexico diminished as farm size, liquidity, access to information and credit, and education increased. For the very small, poor and generally uneducated farmers in the communal areas of KwaZulu-Natal it seems likely that risk will constitute an important transaction cost constraining the rental market for cropland. Lima attempted to reduce risk by witnessing and endorsing written rental agreements negotiated by their clients. Rental contracts negotiated by non-clients were not endorsed by a credible third-party. It was therefore anticipated that Lima clients would face lower *ex post* transaction costs than non-clients as they enjoyed greater assurance of contract enforceability.

3.2 Regression model of tenant investment in crop production

Investment in crop production is expected to increase in the presence of an active rental market. An obvious reason for this is that the market attaches an opportunity cost to under-utilised land, which tends to improve allocative efficiency by transferring land to farmers who are willing and able to use it. Another reason is that the market allows farmers to increase the scale of their operations, which - in the presence of size economies created by fixed transaction, information and management costs - strengthens incentives to invest. In this study, investment in agriculture is measured in terms of expenditure on fertiliser, seed, chemicals and labour used in crop production. Expenditure on operating inputs is an acceptable measure of investment when all of the respondents are tenant farmers with short-term rental contracts.

Section 3.1 explained how risk arising from a possible breach of contract reduces both the incidence of transactions and quantities traded. Risk also influences the type of contract that is negotiated. Transactions tend to be highly personalised when the potential losses resulting from a breach of contract are high (Crookes & Lyne, 2001). In these circumstances, participants prefer to trade with family and friends as this reduces their exposure to moral hazard. Contracts witnessed by a credible authority also carry less risk as they are easier to enforce. Given the uncertainty surrounding enforcement of land rental contracts by traditional courts in KwaZulu-Natal, it was assumed that contracts formally witnessed by a credible third-party and those negotiated with family or friends would reduce risk. These attributes were treated as indicators of relatively efficient contracts and were therefore expected to impact positively on levels of operating inputs applied by tenant farmers.

Other variables expected to influence tenant investment in operating inputs included farmer education, liquidity and the quantity of family labour available for farm work. Following Welch (1978) it was anticipated that better educated farm managers would invest more in operating inputs as they are able to assemble and interpret information at a lower cost than managers with less formal education. Liquidity is an obvious determinant of investment and several studies conducted in the communal areas of KwaZulu-Natal have identified low and irregular household income as a leading constraint to investment in farming (Fenwick & Lyne, 1999). For cash-strapped households, family labour could also be an important determinant of investment in yield increasing inputs. Households better endowed with on-farm family labour are expected to invest more in complementary inputs.

The following regression model was postulated to explain levels of investment made by tenant farmers in the study areas.

Investment = *f*(Secure rental contract, Manager's education, Household liquidity, Family farm labour)

Given the data available, the parameters (β_j) of the following regression function was estimated using the Ordinary Least Squares (OLS) procedure available on the Statistical Package for Social Sciences (SPSS, 2001):

$$\mathbf{LNINV_i} = \beta_0 + \beta_1\mathbf{*LAND_i} + \beta_2\mathbf{*WITNESS_i} + \beta_3\mathbf{*FRIEND_i} + \beta_4\mathbf{*EDU_i} + \beta_5\mathbf{*LIQUID_i} + \beta_6\mathbf{*LAB_i} + u_i$$

where;

i = 1….48 tenant farmers with valid observations on all variables,

LNINV = the natural log of Rands invested in fertilizer, chemicals, seed and labour,

LAND = hectares under maize, potato, beans and vegetables, a control variable to account for area induced differences in LNINV,

WITNESS = dummy variable, scoring 1 if Lima or the Department of Agriculture facilitated and formally witnessed the contract, and 0 if it was self facilitated,

FRIEND = dummy variable, scoring 1 if the contract was negotiated between family or friends, and 0 if it was negotiated between strangers,

EDU = dummy variable, scoring 1 if the household head progressed beyond primary school, and 0 otherwise,

LIQUID = regular off-farm income (measured in Rand per month from wages and welfare grants),
LAB = number of household members able to participate in farming operations (farmers, housekeepers, unemployed labour force participants and one half of pensioners and children),
u = stochastic error term.

The dependent variable was transformed to a natural logarithm (LNINV) as investment is not expected to increase at a constant rate with the explanatory variables. The parameter estimates therefore explain the percentage change in investment given a unit change in their respective explanatory variables. All explanatory variables were expected to have positive β_j following the arguments presented earlier in this section.

4. Results and discussion

This section presents descriptive statistics and regression parameters estimated from the sample data, and discusses the findings.

4.1 Descriptive statistics

Table 1 highlights the small scale of farming (mean of only 2.09 hectares cultivated despite leasing additional land) and low levels of farmer education (less than 30 per cent had progressed beyond primary school). Average investment in seasonal crop inputs (INV) accounts for two-thirds of tenants' mean annual wage and welfare income (LIQUID*12mths). Importantly, there is substantial variation to be explained in the level of investment.

Table 1: Descriptive statistics for variables used in the OLS regression analysis (n=48)

Variable	Mean	Coefficient of variation (%)
INV	2	31.95
LAND	2.09	53.32
WITNESS	0.73	8.90
FRIEND	0.31	6.78
EDU	0.29	22.89
LIQUID	254.63	15.30
LAB	2.04	9.98

Table 2 shows that positive correlation exists between the explanatory variables and the dependent variable, lending support to the postulated model. There is no evidence of collinearity between explanatory variables as the largest absolute correlation coefficient in Table 2 is smaller than 0.5. The variance inflation factors reported in Table 3 confirm that multicollinearity is not a problem in this sample (Gujarati, 2003:362).

Table 2: Correlation matrix of variables used in the OLS regression

INV	1					
LAND	**0.788****	1				
WITNESS	0.026	-0.119	1			
FRIEND	0.060	-0.063	-0.020	1		
EDU	0.108	-0.005	0.175	-0.083	1	
LAB	0.063	0.214	-0.083	-0.182	-0.190	1
LIQUID	**0.290***	0.328	0.104	0.045	0.102	**-0.486****
	INV	**LAND**	**WITNE**	**FRIEND**	**EDU**	**LAB**

Note: ** and * indicate significance at the 1% and 5% levels of probability respectively.

4.2 Regression results

The results of the OLS regression analysis are presented in Table 3. The explanatory variables included in the empirical model account for 60 per cent of the total variation in LNINV, a 'good fit' for cross-sectional data. The positive signs of the estimated parameters (B_j) are consistent with *a priori* expectations. All of the B_j are statistically significant except the parameter estimated for EDU.

Table 3: OLS regression results for investment in seasonal crop inputs (n=48)

Explanatory variable	Unstandardised Coefficients		Standardised coefficients	t-statistic	Variance inflation factor
	B	Std. Error			
(Constant)	7.098	0.199		**35.585*** **	
LAND	0.057	0.008	0.685	**7.081*** **	1.092
WITNESS	0.283	0.143	0.197	**1.979** **	1.162
FRIEND	0.201	0.132	0.146	**1.523***	1.081
EDU	0.036	0.138	0.026	0.262	1.138
LIQUID	0.001	0.000	0.503	**4.774*** **	1.295
LAB	0.096	0.050	0.210	**1.920** **	1.403
R^2	59.8%				
F	**12.6*** **				
df	41				

Note: ***, **, * indicate statistical significance at the 1%, 10% and 15% levels of probability respectively.

As expected, the parameter estimated for the control variable (LAND) is positive and highly significant, which is consistent with the view that rental transactions promote allocative efficiency. The parameter estimated for the dummy variable WITNESS is positive and statistically significant at the ten per cent level of probability. The finding that investment in operating inputs increases by 32.7 per cent (i.e. $e^{0.283} - 1$) when a rental contract is endorsed by a credible witness supports the argument that tenant farmers will invest more, *ceteris paribus*, when potential losses resulting from moral hazard are reduced by enhancing the enforceability of their rental contracts. Since this risk represents a variable transaction cost, it can be inferred that productivity in farming increases with improvements in the efficiency of the cropland rental market.

A similar interpretation holds for the dummy variable FRIEND, for which the parameter estimate is statistically significant at the 15 per cent level of probability. The positive coefficient supports the view that tenant farmers invest more when moral hazard is reduced by contracting with trustworthy lessors, and hence that productivity in farming increases with improved efficiency in the cropland rental market. Summing their standardised regression coefficients, the variables WITNESS and FRIEND jointly contribute relatively more to levels of investment than does family labour.

The parameter estimated for LAB was statistically significant at the ten per cent level of probability, showing that an increase in the household's stock of on-farm family labour adds to the level of its investment in operating inputs. Investment is predicted to grow by 9.6 per cent when the family's stock of on-farm labour increases by one worker. This indicates a complementary relationship between family labour and yield increasing inputs like fertilizer and seed. It is also possible that the increase in investment could be attributed to a greater need to feed unemployed workers. LIQUID, the only other statistically significant explanatory variable considered in the model, is the most important determinant of per hectare investment in operating inputs. It is estimated that an additional Rand of monthly liquidity will increase investment on a given area by 1.2 per cent.

5 Conclusion

Liquidity problems were identified as a serious constraint to investment in crop production, highlighting the familiar problems of low wage earnings, weak job skills, unemployment and poor access to agricultural credit. Investment is also constrained by the availability of family labour for farm work, suggesting that the liquidity problem is pervasive - even relatively cash rich households cannot hire sufficient farm labour. Such circumstances emphasise the importance of an efficient rental market to transfer under-utilised cropland to households that are willing and able to farm it.

The results of this study support the view that a rental market for cropland does promote allocative efficiency, and that investment increased with efforts to reduce moral hazard and losses caused by a breach of the rental contract. It can be concluded that interventions which reduce the risk of losses caused by a breach of contract would promote market efficiency and investment in crop production. In the short-run external agents, like the Provincial Department of Agriculture, could reduce transaction costs in the rental market for cropland by sanctioning contracts negotiated by lessors and lessees. Ultimately, legal reform that leads to predictable contract enforcement in the communal areas is required to improve market efficiency and levels of investment in agriculture.

These recommendations assume that individual property rights to cropland do not become less secure following implementation of the Communal Land Rights Act (CLaRA), Act 11 of 2004. Although the stated purpose of CLaRA is to provide for legal security of tenure by transferring communal land to communities, there

is no guarantee that the institutional arrangements adopted by communities will improve individual tenure security to cropland. This introduces an important area for future research.

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