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A LAND RENTAL MARKET IN KWAZULU: IMPLICATIONS FOR FARMING EFFICIENCY

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Abstract

This paper emphasises efficiency and equity aspects of a rental market in rural KwaZulu. Most households have little incentive to farm land intensively. Almost 22 per cent of arable land is unused. Evidence from a sample survey suggests that land rental is precluded by high transaction costs. Transaction costs are high because lessors consider renting to be risky as they could lose their right to land unless they farm it themselves. Nearly 70 per cent of households perceived that they would be dispossessed if they did not show some use of their arable land. Rental transactions were observed only where the risk was low, i.e. where the government or chief was lessor. Results of a discriminant analysis show that surplus farmers rent in more land, invest more in agriculture and make greater use of credit and extension services than do deficit producers. Area rented was the most important of these discriminating variables. Of those respondents renting, 84 per cent claimed they would increase production if they could access more land. Expansion of farm sizes through renting improves the incentive to farm by lowering unit production costs and by increasing potential gains, as returns to information, innovation and management are scale dependent. Equity improves because rental transactions are voluntary. Inefficient land use is the result of an inefficient land market. Solutions may be found in efforts to reduce transaction costs in the rental market.

Uitreksel

Hierdie artikel beklemtoon die doeltreffendheid en billikheidsaspekte van 'n huurmark vir landbougrond in landelike KwaZulu. Die meeste huisgesinne het min aansporing om intensief te boer. Bykans 22 persent van verboubare landbougrond word nie benut nie. Volgens 'n steekproefopname blyk dit dat hoë transaksiekoste verhinder dat die grond verhuur word. Transaksiekoste is hoog omdat die huurders glo dat dit te veel van 'n waagstuk is om die grond te verhuur want hulle staan gevaar om hulle grond te verloor tensy hulle self boer. Bykans 70 persent van die huisgesinne glo dat die grond teruggeneem sal word deur die stamowerheid indien hulle nie kan bewys dat hulle dit benut nie. Huurtransaksies het alleenlik plaasgevind waar die risiko laag was bv. waar die regering of hoofman die verhuurder was. Resultate van 'n diskriminant ontleding het bewys dat boere wat 'n surplus produseer meer grond huur, meer belê in die landbou en meer gebruik maak van krediet en voorligting dienste as die boere wat ontoereikende produksie lewer. Die grootte van die grond wat verhuur word, is die belangrikste veranderlike in die ontleding. Bykans 84 persent van respondente beweer dat hulle, hul produktiwiteit kan verhoog as hulle toegang sou hê tot meer grond. Konsolidasie van landbougrond deur middel van verhuring verhoog die aansporing om in die landbou te belê, deurdat eenheidskoste daal en wins verhoog omdat die rendement op inligting, innovasie en bestuur afhang van die skaal van die boerdery. Billikheid verbeter omdat huurtransaksies vrywillig is. Ondoeltreffende grondverbruik is as gevolg van 'n ondoeltreffende grondmark. Pogings om die transaksiekoste van die verhuringsmark te verlaag mag 'n oplossing bied.

1. Introduction

There is much debate on the merits of small and large farm strategies. The author contends that policies designed to promote these strategies could result in farming inefficiency and inequity. It is argued that farm sizes should be determined by market forces, and that a land rental market would be the most appropriate way of achieving this in KwaZulu. The virtual absence of land rental in KwaZulu, due to high transaction costs, has resulted in farming inefficiency as willing farmers cannot access underutilised and idle land. Results of a discriminant analysis reported in this paper show that farmers who rent in land invest more in agriculture.

2. Farm size and efficiency of land use

Small farm strategists advocate a policy of dividing larger farms into smaller farms. They argue that productivity per hectare is higher on a smaller farm. Others support the notion of larger farms, on the grounds that large farmers can take greater advantage of scale economies and credit facilities, are more responsive to price supports, and more inclined to adopt new technology. Ellis (1988:192) argues that the small farm strategy is based upon the capacity of small farms to substitute for, and even surpass the marketed output performance of large farms, while at the same time fulfilling employment and equity goals which large farms do not meet. The concept of an inverse relationship between farm size and productivity has received much attention during the 1960's and early 1970's. It is regarded as one of the 'stylised facts' of traditional agriculture (see for example Bardhan, 1973; Berry and Cline, 1979; Bhalla, 1979; Ellis, 1988; and Lau and Yotopoulos, 1971). Many of these studies have used production functions as an efficiency measure. By redistributing land into smaller units, one cannot conclude that this would result in more intensive farming as farms of different sizes have different production functions. Large farmers have more incentive to adopt new technology because returns to adoption are scale dependent. Therefore the total quantity of variable inputs (including labour) used, and output produced by numerous small farms may not exceed the total amounts used and produced by fewer larger farms on the same area.

Large farm strategy is based on the fact that gains from agricultural innovations are scale dependent as expected profits are proportional to farm size. The fact that adoption rates are related to farm size, has been well documented by economists worldwide (see for example Feder, 1985; Feder *et al*, 1982; Shaw and da Costa, 1985; and Welch, 1978). Technology is more productive the larger the scale of activities to which it is applied. Large farmers thus have greater incentive to make investments. Consequently, efficiency and employment may both be higher on large farms.

It is not the purpose of this study to further a large farm or a small farm strategy. In the long run the administering of farm sizes by promoting either strategy could have efficiency and equity drawbacks. The object of this paper is to demonstrate that where farms are small and there is no land market, farming efficiency and equity can both be improved by facilitating voluntary rental transactions.

3. Market failure in traditional agriculture

If the land market is competitive, land will transfer to it's most efficient use, i.e. rents are maximised. Rents therefore provide the best measure of efficiency (for large and small farms) when society views land as a scarce resource (Nieuwoudt, 1990).

Where the land market is imperfect it is unlikely that land use will be efficient (Pasour, 1990). Unfortunately there are no rental data for KwaZulu (this fact alone hints at an inactive land market). Nevertheless, it is patently obvious that land is not farmed efficiently in KwaZulu: Arable land is underutilised and grazing land is overutilised. Lyne (1989:10) estimates that 22 per cent of arable land in KwaZulu is left fallow. Lyster (1990) reports a comparable estimate of 20 per cent, while Knight and Lenta (1980) estimate the figure to be 27 per cent. Crop yields in KwaZulu are extremely low. It is estimated that maize yields average 0.826 t/ha in KwaZulu and 2.088 t/ha in Natal (Lyne, 1989:9). Grazing is heavily utilised in KwaZulu, with the average stocking rate approximately double that of privately owned farms in Natal. Herd mortality rates are almost double those in Natal. Calving rates are only 32 per cent in KwaZulu, in comparison to 80 per cent in Natal (Lyne, 1989:52).

Nieuwoudt (1990) identifies the following causes of market failure in traditional agriculture:

i) Free access to communal grazing

There is no restriction on the number of cattle which individual stock owners may graze on the common. This results in 'free-riding' and heavy utilisation of grazing resources. Furthermore, there is little incentive for stock owners to upgrade herd and pasture quality as they are unable to internalise the benefits from their efforts.

ii) Opportunity cost of arable land

According to Low (1986:50-53) few households have an incentive to crop their arable land intensively. Households have little incentive due to (a) small farm sizes and (b) many households are able to procure food and income at lower cost by allocating workers to off-farm employment. However, the reason that arable land is underutilised is that there is no opportunity cost to penalise non-users. Where a land market exists, non-users are penalised by the income foregone by not selling or renting land to users. In this case households would rather rent their land to tenants than leave it idle (Lyne and Nieuwoudt, 1991). At present the opportunity cost of non-use is zero because tribal tenure arrangements prohibit the sale of land and have virtually precluded land rental.

Sample survey data used in this study indicate that the rental market in KwaZulu is inactive. In a sample of 308 households, 155 indicated that they would like to rent in land. However, only 19 households engaged in rental transactions. Of those households renting, only 3 rented land from other households. The remainder rented land either from the government or a tribal authority. Fifty per cent of the respondents indicated that land was not available for renting. Clearly, households that do farm are unable to rent in idle land. In a study of the Vulindlela District conducted by Lyster (1990:57), approximately 86 per cent of all surplus farmers indicated that they needed more land. However, only 20 per cent of these farmers were able to rent in land. Lyne (1989:62) observed that 6 out of 8 'top' livestock farmers in the Umzansi district expressed difficulty in obtaining additional land for growing fodder crops.

An efficient land market requires security of property rights and transaction costs must be small (Nieuwoudt, 1990). It is apparent that these requirements are not met in KwaZulu. As a result the land rental market is incomplete and land use is inefficient.

3.1. Transaction costs

Every transaction involves a contract, and in establishing and upholding contracts there are certain costs involved. There are costs of negotiating and enforcing the stipulations of the contract. De Alessi (1983) defines transaction costs as the costs of obtaining information about alternatives, and of negotiating, policing and enforcing contracts. The criteria for organising transactions is one of cost minimising. The object is to economise on the sum of production and transaction costs. If these costs exceed revenue gained, the contract will not be entered into.

High transaction costs may have precluded a rental market in KwaZulu. As Cheung (1970:70) notes 'transaction costs may be so high as to result in the absence of contracting among individuals'. In KwaZulu, transaction costs are high because lessors consider renting to be risky as they could lose their right to land along with the economic benefits conferred by these rights. In this study nearly 70 per cent of the households sampled stated that they would be dispossessed of their land if they did not use it themselves. Eighty per cent of the rental arrangements observed were between family relatives and close friends, or where government acted as lessor. Friends and relatives are unlikely to claim rented land, and claims against the government are unlikely to succeed. Hence in the rental cases observed, transaction costs were relatively low as risk of dispossession was greatly reduced.

The risk of losing land rights adds to the transaction costs borne by the lessor. Approximately 40 per cent of the households interviewed perceived that they would lose their land rights if they rented their land to other households, while a further five per cent indicated that they were prohibited from leasing out their land.

Moral hazard is also a problem. Landlords may incur heavy costs in searching for, monitoring and enforcing rental contracts. If these costs are high relative to rental income a landlord will not lease out his land. In KwaZulu rental contracts for land are not legally enforceable.

Small farm sizes also increase transaction costs as many contracts may be needed to control a large farm (Hoffman and Spitzer, 1982). Even if land could be rented in or leased out freely, fixed costs could still inhibit or eliminate rental transactions. Households may only be able to rent land that is not located close to the holding already operated. The fixed cost of time consuming shuttles between holdings may wipe out additional profits from the rented land (Feder, 1985).

In the case of communal grazing land the establishment of a rental market would first require a transition from communal to private access. Popkin (1979:1-5) states that this transition is often accompanied by protests due to loss of subsistence and security. In tribal areas land is also a source of political power and entrenched interest groups such as chiefs may resist changes that erode their power.

To facilitate a rental market in KwaZulu, transaction costs or perceived risks will have to be eliminated or reduced. For example, rental contracts between households could be endorsed by the local tribal authority, and held by an independent arbitrator. The contracts must also be enforceable. The incentive to promote rental transactions would increase if tribal

authorities were permitted to tax part of rental income. This might provide tribal authorities with an opportunity to consolidate their support by funding local infrastructure.

3.2. The advantages of a rental market

A rental market will make the opportunity cost of inefficient land use visible and land will transfer to those who can make better use of it (Nieuwoudt, 1990). Without an indication of the intentions of households, it is not possible to define optimal plot sizes (Latt and Nieuwoudt, 1988). Households are able to express their intentions through the market, making it possible for them to either increase or decrease farm scale according to their objectives. Different crops impose different demands upon farm management, therefore optimising farmers who have different risk preferences and opportunity costs produce different crops and operate farms of different sizes (Bates, 1989:79).

Farmers are able to expand farm sizes through renting and are thus able to take advantage of scale dependent returns and economies resulting in improved rates of innovation adoption, increased production and higher farm incomes. Since labour and capital inputs are usually complementary at low levels of output, increasing derived demand for inputs and greater sales are expected to generate significant employment opportunities in agriculture and its service industries (Lyne et al, 1990). Larger farmers are more responsive to price changes and farmer support programmes. The productivity of extension services and training courses will increase as returns to education are greater on larger farms (Welch, 1978).

A rental market also has positive equity implications. Rental transactions are voluntary, thus income benefits accrue to both landlord and tenant (Nieuwoudt, 1990). Further, rental transactions do not entail permanent loss of usufruct rights. Cross (1987) argues that, given freehold title, poor households will sell their allotments for cash against their own better judgement and future regret for survivals sake. However, a rental market does not create a landless class and has no effect on residential rights. Rather, it improves equity as lessors would gain rental income from land that would otherwise have been idle or underutilised, while lessees are able to access additional land without diverting working capital into land purchase (Lyne, 1989:129-130). In areas unsuitable for crop production, households with no livestock derive very little income from their land. Rental agreements for grazing land would thus improve equity as income transfers from wealthier stock owners to other households (Lyne and Nieuwoudt, 1991).

4. Empirical findings

Discriminant analysis was applied to data recorded in a sample of 308 households drawn from three tribal wards (Amaci, Khanyile and Hlabisa). This technique is concerned with the problem of statistically distinguishing between two or more groups of cases on a set of discriminating (i.e. explanatory) variables (Klecka, 1975:435). In this study the objective was to distinguish between deficit and surplus producers (model 1), as well as between high and low input users (model 2). The standardised weighting coefficients of a discriminant function reflect the relative importance of each discriminating variable. All coefficients with a t-value greater than one were retained in the estimated function.

Since farm output is difficult to measure in subsistence agriculture, two proxy measures were considered, namely crop income and input use. Surplus farmers generally have higher farm output (Nieuwoudt and Vink, 1989). However, crop income is influenced by weather, time of planting, own consumption etc. The observed income data also include sales from the previous season. For this reason, input use may provide a more meaningful measure of output as it reflects expectations. Auerbach (1989) reports that farmers in KwaZulu using large quantities of fertilisers realised higher outputs. The results are summarised in Tables 1 and 2. It was hypothesised that high output farmers would make more use of institutional credit (KFCL), purchase more fertilisers (INPUT) and chemicals (CHMC), rent more land (ARNT), own more assets (ASSET) and draught animals (OX), and make more use of contractor services (CNTRCT), than deficit producers. One would also expect high output farmers to have more regular contact with extension officers (AONM).

The variables OX and AONM were excluded from model 1 as their estimated coefficients had t-values less than one. Model 1 shows that surplus producers rent in more land, invest more in farming assets, use more inputs and make greater use of credit facilities. Land rental and the use of inputs are the most important variables discriminating between surplus and deficit producers. Almost 85 per cent of the respondents claimed that they would increase production if they could access more land.

Table 1: Estimated discriminant function for surplus and deficit producers

Model 1				
Standardised Discriminant Function			Group Means	
Discriminating Variable	Coefficient	t value	Deficit Producer	Surplus Producer
INPUT (R)	0.465	2.49**	150.97	755.81
ASSET[1] (%)	0.271	1.96*	0.043	0.192
CNTRCT (R)	0.234	2.08**	75.46	318.35
KFCL (R)	0.194	1.64	42.87	228.73
ARNT (ha)	0.611	6.13**	0.001	0.307
CHMC (R)	0.407	3.82**	1.940	29.92
Number of valid cases			208	26
Wilks' lambda			0.60	
F value			25.41**	

Table 2: Estimated discriminant function for high input and low input users

Model 2				
Standardised Discriminant Function			Group Means	
Discriminating Variable	Coefficient	t value	Low Input	High Input
CNTRCT (R)	0.284	2.49**	70.02	203.02
ASSET[1] (%)	0.337	3.00**	0.025	0.158
OX	0.197	1.72	1.13	1.80
AONM[2] (%)	0.166	1.43	0.54	0.84
ARNT (ha)	0.454	4.09**	0.007	0.18
KFCL (R)	0.785	7.53**	15.31	217.33
Number of valid cases			159	57
Wilks' lambda			0.63	
F-value			20.50**	

1. ASSET = 1 if household owns tractor & plough, else 0
2. AONM = 1 if household knows Agric Officer, 0 otherwise
3. ** = significant at one per cent level of probability
4. * = significant at five per cent level of probability

Model 2 has more degrees of freedom in the smaller group which is more desirable as tests for statistical significance are more reliable. High input farmers tend to rent in more land, use more institutional credit, spend more on contractor services, invest more in assets and draught animals, and make greater use of extension services than do low input farmers. Institutional credit and land rental are the most important variables in discriminating between high input and low input users.

7. Conclusion

In KwaZulu, most rural households have little incentive to farm and land is cultivated extensively because farms are uniformly small, and food and income can be aquired at lower cost by wage workers. Land remains idle as there is no opportunity cost to penalise non-use. This situation arises when there is no land market. A rental market will therefore improve land use efficiency as resources move towards households which are best able to utilise them. Equity is also expected to improve as rental transactions are voluntary and do not create a landless class. The rental market is inactive because transaction costs are high in KwaZulu. Rental transactions only occured where the risk of dispossession was greatly reduced i.e. transaction costs were low. The lowering of transaction costs would entail the establishment of a legal structure which would protect the land rights of the lessor and lessee. Results of discriminant analyses indicates that households are able to expand farm sizes through renting, giving farmers a greater incentive to invest in agriculture as potential returns are scale dependent. The demand for, and the effectiveness of extension services increases with farm scale.

Note

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References

AUERBACH, RMB. (1990). 'An experiment in low-input maize production in KwaZulu'. Development Southern Africa, Vol 7:65-76

BARDHAN, PK. (1973). 'Size, productivity, and returns to scale: An analysis of farm level data in Indian agriculture'. Journal of Political Economy, Vol 81:1370-1386.

BATES, RH. (1989). Beyond the Miracle of the Market. Cambridge University Press.

BERRY, RA and CLINE, WR. (1979). Agrarian Structure and Productivity in Developing Countries. Johns Hopkins University Press.

BHALLA, SS. (1979). 'Farm size, productivity and technical change in Indian agriculture'. In Agrarian Structure and Productivity in Developing Countries, edited by Berry, R A, and Cline, W R. Johns Hopkins University Press.

CROSS, CR. (1987). The land question in KwaZulu: Is land reform necessary? Development Southern Africa, Vol 4:428-451.

DE ALESSI, L. (1983). 'Property rights, Transaction Costs, and X-inefficiency: An essay in economic theory'. American Economic Review, Vol 73:64-81.

CHEUNG, SNS. (1970). 'The structure of a contract and the theory of a non-exclusive resource'. Journal of Law and Economics, Vol 13:49-70.

ELLIS, F. (1988). Peasant Economics. Cambridge University Press.

FEDER, G. (1985). 'The relation between farm size and farm productivity'. Journal of Development Economics, Vol 18:297-313.

FEDER, G, JUST, RE and ZILBERMAN, D. (1982). Adoption of agricultural innovations in developing countries: A survey. World Bank Publication.

HOFFMAN, E, and SPITZER, ML. (1982). 'The Coase theorem: Some experimental tests'. Journal of Law and Economics, Vol 25:73-98.

KLECKA, WR. (1975). Statistical Package for the Social Sciences SPSS. Second Edition. New York: McGraw Hill.

LATT, EA and NIEUWOUDT, WL. (1988). 'Identification of plot size effects on commercialisation of small-scale agriculture in KwaZulu'. Development Southern Africa, Vol 5:371-382.

LAU, LJ and YOTOPOULOS, PA. (1971). 'A test for relative efficiency and application to Indian agriculture'. American Economic Review, Vol 61 94-109.

LOW, A. (1986). Agricultural Development in Southern Africa. David Phillips, London.

LYNE, MC. (1985). 'Using linear and logit functions to identify adopters and non-adopters of farm technology: some policy considerations for KwaZulu' Development Southern Africa, Vol 5:495-500.

LYNE, MC. (1989). 'Distortion of incentives for farm households in KwaZulu'. Unpublished Phd dissertation, University of Natal, Pietermaritzburg.

LYNE, MC and NIEUWOUDT, WL. (1990). 'The real tragedy of the commons: Livestock production in KwaZulu'. The South African Journal of Economics, Vol 58:88-96.

LYNE, MC and NIEUWOUDT, WL. (1991). 'Inefficient land use in KwaZulu: Causes and remedies'. Development Southern Africa, Vol 8:193-201.

LYNE, MC, ORTMANN, GF and VINK, N. (1990). 'Simulated responses to changes in economic incentives: Some policy implications for KwaZulu'. Unpublished paper, University of Natal, Pietermaritzburg.

LYSTER, DM. (1990). 'Agricultural Marketing in KwaZulu: A farm household perspective'. Unpublished M.Sc. Agric. thesis, University of Natal, Pietermaritzburg.

NIEUWOUDT, WL and VINK, N. (1989). 'The effects of increased earnings from traditional agriculture in Southern Africa'. South African Journal of Economics, Vol 57:257-269.

NIEUWOUDT, WL. (1990). 'Efficiency of land use'. Agrekon Vol 29:210-215.

PASOUR, EC. (1990). 'Agricultural policy analysis: Problems and opportunities.' Agrekon, Vol 29:417-423.

POPKIN, SL. (1979). The Rational Peasant. University of California Press.

SHAW, AB and da COSTA, R C. (1985). 'Differential levels of technology adoption and returns to scale in the Guyanese rice industry'. Canadian Journal of Agricultural Economics, Vol 33:99-110.

WELCH, F. (1978). 'The role of investments in human capital in agriculture'. In Distortion of Agricultural Incentives, edited by Schultz, T W. Indiana University Press, Bloomington.