

Full Length Research Paper

Factors influencing access to credit: A case study of smallholder farmers in the Capricorn district of South Africa

P. K. Chauke , M. L. Motlhatlhana, T. K. Pfumayaramba and F. D. K. Anim

Department of Agricultural Economics, University of Venda, Thohoyandou, 0950, South Africa.

Accepted 18 February, 2013

The study was pursued to ascertain factors that affect smallholder farmer's access to credit sources in the Capricorn District Municipality of Limpopo Province, South Africa. A stratified sampling method was employed to select 250 smallholder farmers in the study area. Structured questionnaires were developed, pre-tested and used for collecting data from the sampled smallholder farmers. The logistic regression model was employed in the analysis. Factors that contributed significantly to credit access were the need for credit, attitude towards risk, distance between lender and borrower, perception on loan repayment, perception on lending procedures and total value of assets. Policy recommendations included the establishment of loans offices close to farmers and operated by officers familiar with farmers to reduce lending procedures, risks and educate them on perceptions on loan repayment.

Key words: Credit, risk, perception, smallholder farmers, logistic regression.

INTRODUCTION

More than 18 years of independence rule in South Africa, little in terms of livelihood generation to smallholder farmers in the country's former homeland rural areas has been achieved, despite government's intention to attain food security in rural areas. One important factor that requires a thorough investigation relates to credit access directed at smallholder farmers. As attested by Okurut et al. (2004), credit is an important instrument for improving the welfare of the poor directly through consumption smoothening that reduces their vulnerability to short-term income. It also enhances productive capacity of the poor through financing investment in their human and physical capital. Manganhele (2010) noted that in many developing countries such as Botswana, Mozambique and Ethiopia, access to credit by smallholder farmers has been burdened for many decades. Despite efforts by some of these governments to provide conducive policies that would ensure credit access to smallholder farmers,

actual support has generally not only been static but has even declined in some parts of the developing world. Efforts by most developing countries to channel credit via parastatal institutions have yielded minimal positive results (Machethe, 2004).

The South African government, both during and immediately after independence, focused on financial assistance to emerging rather than smallholder subsistence farmers that are widespread in the rural landscape. Parastatal organisations initiated to achieve such an objective included Ithala Development Finance Corporation in KwaZulu Natal province, Agricultural Development Banks of Ciskei and Transkei, Agribank of the North West Province, Gazankulu Development Finance Corporation, Lebowa Development Finance Corporation both in Limpopo Province, and Uvimba Finance Corporation in the Eastern Cape. Due to lack of investment from government, these institutions have collapsed or merged with other organisations. Consequently access to credit by the small-scale farming sector is still a major challenge that confronts many smallholder farmers in South Africa (Coetzee, 1995). This paper seeks to assess factors that have impact on credit access

*Corresponding author. E-mail: peakay@univen.ac.za. Tel: +27794963140. Fax: +27159628598.

by smallholder farmers in the Capricorn District Municipality of South Africa.

MATERIALS AND METHODS

Study area and data sources

The study was conducted in the Capricorn District Municipality that is situated at the centre of Limpopo Province in South Africa. The district hosts Polokwane, the capital city and economic hub of Limpopo Province and consists of five local municipalities, that is, Polokwane, Lepelle-Nkumpi, Molemole, Blouberg and Aganang. The Capricorn district covers an area of 2,170,545 ha and has a population of about 1,235,325 (STATSSA, 2007). It therefore ranks number one in the province in terms of population and farming area. Besides Polokwane city in the Polokwane Local Municipality and Lebowakgomo Town in Lepelle-Nkumpi Local Municipality, most of the remaining area is rural or semi-rural. The district therefore hosts a substantial numbers of smallholder farmers as compared to their commercial oriented counterparts (82% vs. 18%), although in terms of area of coverage the latter far outnumbers the former. The district is not only endowed with abundant agricultural resources, it is also one of the country's prime agricultural regions noted for the production of vegetables and field crops (NDA, 2009). Most of the aforementioned commodities are largely produced by white commercial farmers, with the majority of black small-scale farmers cultivating small quantities of field and vegetable crops (Baloyi, 2010).

The study used both qualitative and quantitative approaches in data collection and analyses. Secondary data on farm credit were collected from existing literature while primary data were collected through face-to-face questionnaire based interviews that were administered to smallholder farmers.

Specific predictor variables that were assessed included credit need, attitude towards credit, distance between borrower and lender, smallholder farmers perceptions on loan repayment, lending procedures, total value of assets possessed by the smallholder farmer and the actual time spent per visit to lender.

There were 2500 farmers operating on small-scale farming in the Capricorn District (LDA, 2008). A 10% representative sample, 250 farmers, stratified by the local municipality and status with respect to access to credit was selected based on proportional systematic random selection technique within each of the local municipalities. This technique involved clustering smallholders per local municipality, determining proportional samples based on populations, listing all smallholders in each local municipality, and selecting samples based on a predetermined sampling fraction appropriate for each local municipality. Enumerators administered a pretested questionnaire to ensure validity and reliability of the results of the study.

Data analysis

The data were captured into the SPSS spreadsheet and analyzed through the binary logistic regression modeling technique. The main aim of the analysis was to determine the factors influencing access to credit in the study area. The technique has been used for this kind of a situation (field of social sciences) where prediction of the presence or absence of an outcome based on values of a set of predictor variables is needed. According to Wooldridge (2009), the logistic regression coefficient can be used to estimate odds ratios for each of the independent variables in the model. The logistic regression model (logit model) is applicable to a broader range of research situations than discriminant analysis. The term "logit" refers to the natural logarithm of the odds (log odds) which

indicates the probability of falling into one of two categories on some variable of interest (Wooldridge, 2009). According to Harrell (2001), binary logit has only two categories in the response variable, that is, event A and non-event A. Harrell (2001) also asserts that the model shows how a set of predictor (explanatory) variables (X's) are related to a dichotomous response variable Y (ln (P_i/1 - P_i)). The dichotomous response variable Y = 0 or 1 with Y=1 denotes the occurrence of the event of interest while Y=0 denotes otherwise. The dummy variables, also known as indicators and bound variables, characterize dichotomous responses.

In this study, since only two options were available, namely "access to credit" or "no access to credit" a binary model was set up to define Y=1 for situation where the farmer accessed credit and Y=0 for situations where the farmer did not access credit from either formal or informal credit sources. Assuming that X is a vector of explanatory variables and p is the probability that Y=1, two probabilistic relationships as stated by Wooldridge (2009) can be considered as follows:

$$p(Y = 1) = \frac{e^{\beta x}}{1 + e^{\beta x}} \tag{1}$$

$$p(Y = 0) = 1 - \frac{e^{\beta x}}{1 + e^{\beta x}} = \frac{1}{1 + e^{\beta x}} \tag{2}$$

Woodridge (2009) concluded that since Equation (2) is the lower response level, that is, the probability that farmers did not access credit from formal and informal credit source, this will be the probability to be modeled by the logistic procedure by convention. Both equations present the outcome of the logit transformation of the odds ratios which can alternatively be represented as:

$$\log \text{it}[\theta(x)] = \log \left[\frac{\theta(x)}{1 - \theta(x)} \right] = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k \tag{3}$$

and thus allowing its estimation as a linear model for which the following definitions apply:

- θ = logit transformation of the odds ratio;
- α = the intercept term of the model;
- B = the regression coefficient or slope of the individual predictor (or explanatory) variables modeled and
- X_i = the explanatory or predictor variables.

The foregoing operations were feasible within the SPSS package. In relation to Equation (3) the analysis generated the odd ratios using the maximum likelihood procedure (Field, 2005). The logistic regression in this study can be specified as:

$$Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 \dots + u_k \tag{4}$$

where, Y_i (SHAC) = the dependent variable defined as the access to credit by smallholder farmers = 1 and 0 otherwise; α = constant and intercept of the equation; X₁ (CRE) = need for credit by the respondent, 1 = had a need and 0 = otherwise; X₂ (RIT) = attitude towards risks by the respondents, 1 = they do not fear risk and 0 = otherwise; X₃ (DIS) = distance between the lender and borrower, 1 = 15km and above and 0 = <15 km; X₄ (SHO) = farmers' perception of loan repayment, 1 = perceive it as a constraint and 0 = otherwise; X₅ (LEP) = farmers perception of lending procedures, 1 = perceive it as a constraint and 0 = otherwise; X₆ (EXE) = actual time spent with extension officer per visit in hours, 1 = > 1 h and 0 = < 1 h; X₇ (TIN) = total income from farming per year (Rand); X₈ (TAS) = total value of assets possessed by the respondent, 1 = >R 50000 and 0 = < R 50000, and U_k = correction error term. Prior to running the

Table 1. Contingency coefficients of association of included variables.

	CRE	RIT	DIS	SHO	LEP	EXE	TIN	TAS
CRE	1.00							
RIT	0.21	1.00						
DIS	0.095	0.85	1.00					
SHO	-0.153*	-0.153*	-0.231**	1.00				
LEP	-0.109	-0.90**	-0.078	0.364**	1.00			
EXE	-0.136*	-0.151*	0.068	0.071	0.174**	1.00		
TIN	0.980	0.096	0.165**	0.111	0.030	-0.29	1.00	
TAS	-0.165**	0.041	0.002	0.232**	0.444**	0.36	-0.16	1.00

** P<5%; * P<10%; n = 250; Source: Field Survey (2012).

Table 2. Estimate regression model of access to credit.

Explanatory variable	β	Std error	Wald	Exp (β)	P-value
Constant	18.25	4.89	13.92		
CRE	1.67**	0.84	3.98	5.299	0.046
RIT	- 1.20*	0.68	3.10	0.301	0.078
DIS	- 1.62*	0.88	3.41	0.197	0.065
SHO	- 2.27***	0.58	15.48	0.103	0.000
LEP	- 2.55***	0.64	15.79	0.078	0.000
TAS	- 4.75**	0.78	37.33	0.009	0.035
EXE	1.53***	0.73	4.42	4.603	0.000
TIN	-1.94	1.20	2.61	0.143	0.106

***p<0.01; **p<0.05; *p<0.10; N=250; Source; Survey data (2012). Marginal effects could not be calculated since SPSS V.16 was used in the analysis

logistic regression model, the independent variables were checked for the existence of multicollinearity problems. The result proved negative and non-significance.

RESULTS AND DISCUSSION

The correlation matrix of variables included in the analysis is presented in Table 1, while Table 2 shows the estimated regression model.

The credit need and extension contact had significant positive influences on the respondent's access to credit. The positive signs of credit need and extension contact implied that access to credit increased with increases in the variables. On the contrary, a negative sign of attitude towards risk, repayment period, lending procedures and total value of assets implied that access to credit decreases with an increase in these variables.

As indicated by the Exp (β) values, a value less than 1 would indicate the opposite. Thus as the odds of a credit need increases by one unit, that of actual access to credit increases by more than 5 times. A similar explanation pertains to the need for extension services in which actual need for credit increases by more than 4 times. However as the odds of needs for the other variables increase by 1 unit, there are progressive decreases in the

odds for the actual need to access credit. The findings of this study are consistent with that of Beck (2007), whereby it was indicated that extension services play a crucial role in empowering farmers with farming techniques, knowledge and management skills. In addition, extension services provide essential information to farmers regarding agricultural interventions such as farm production technologies, facilitating farm management, marketing and processing equipment. Machethe (2004) further indicated that growth in smallholder farming is indescribable without support services. While logistic results for this study depict decreasing need for accessing credit with unitary increases for the remaining predictor variables, a study by Yehuala (2008) in Ethiopia confirmed that repayment period was a critical factor in influencing access to credit. Although risks and uncertainties are not only unique to agricultural production, they are much more conspicuous in farming than most non-farming activities. The type and severity of risks faced by farmers in general vary with the type of farming system, physical situations, economic conditions and prevailing policies (Klein et al., 1999). Hussien (2007) has affirmed that farm households are discouraged to borrow when credit sources are located further away from their farming operations. The results of

the total value assets are contradictory with a study conducted by Atieno (2001) which indicates that among other factors value of farm assets owned is a significant variable that explain the participation of smallholder farmers in formal credit markets. According to Fleisig (1999), farmers experience is a critical factor in adopting modern technologies and accumulation of assets. The finding that increased asset accumulation will result in decreased dependence on credit is understandable and reflective of realities. Contrary to this finding, a study by Kgowedi et al. (2003) associated increased credit needs with increased income generation.

SUMMARY AND CONCLUSIONS

The intention of the paper was to assess the access to credit by smallholder farmers in the Capricorn District Municipality of the Limpopo Province, South Africa. Stratified, clustering and proportional systematic random sampling techniques were used to select the respondents in the study area. The logistic regression was used to analyze the data. The results showed that as the odds of a credit need increased by one unit that of actual access to credit increased substantially (more than 5 times). A similar explanation pertained to the need for extension services in which actual need for credit increased by more than 4 times. Access to credit decreased with unitary increases of the other variables, notably repayment period, risk and uncertainty, distance between borrower and lender, farmer experience and asset accumulation.

RECOMMENDATIONS

The study recommends that since farmers were found to be risk averse and dependent on own assets, there is the need for effective training programmes that would include access to insurance and use of modern technologies such as cell phones, to close the gap between lender and borrower. The study also recommends the establishment of loans offices close to farmers and which will be operated by bank officials who may be familiar with farmers in the area to reduce lending procedures, risks and educate them on perceptions on loan repayment.

ACKNOWLEDGEMENTS

The authors would like to express their special thanks to the University of Venda, National Research Foundation and the Land Bank for the fund provided for carrying out the study.

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