

## Smallholder farmers' access to credit in the Amathole District Municipality, Eastern Cape Province, South Africa

Lloyd J. S. Baiyegunhi<sup>a,\*</sup>, Gavin C. G. Fraser<sup>b</sup>

<sup>a</sup>SAEES - Discipline of Agricultural Economics, University of KwaZulu-Natal, Scottsville 3209, Pietermaritzburg, South Africa

<sup>b</sup>Department of Economics and Economic History, Rhodes University, Grahamstown 6140, South Africa

---

### Abstract

Provision of credit has been identified as an important instrument for improving the welfare of smallholder farmers directly and for enhancing productive capacity through financing investment by the farmers in their human and physical capital. This study investigated the individual and household characteristics that influence credit market access in Amathole District Municipality, Eastern Cape Province, South Africa, using a cross sectional data from smallholder farmers' household survey. The aim is to provide a better understanding of the households' level socio-economic characteristics, not only because they influence household's demand for credit but also due to the fact that potential lenders are most likely to base their assessment of borrowers' creditworthiness on such characteristics. The results of the logistic regression suggest that credit market access was significantly influenced by variables such as gender, education, households' income, value of assets, savings, dependency ratio, repayment capacity and social capital. Implications for rural credit delivery are discussed.

*Keywords:* smallholder, rural households, access, credit, productivity

---

### 1 Introduction

Improving access to credit is often regarded as one of the key elements in raising agricultural productivity and has been widely perceived as an effective strategy to increase smallholder productivity and alleviate poverty (Sharma, 2000; Adugna & Heidhues, 2000; Binswanger & Khandker, 1995). It can relax the liquidity constraints that smallholder farmers face, improve their risk bearing capability, influence adoption of new farm technology, equip them with new skills and create jobs, and encourage activities that generate dynamic economic

growth, and helps smallholder households cope with ex-post risks of negative-income shocks and to smooth income and consumption flows (Khandker, 2003; Parker & Nagarajan, 2001; Rosenzweig, 2001; Zeller, 2000). Expanded access to credit has therefore been enthusiastically canvassed in the development community for its ability and potential to generate sustainable economic growths that favour the poor (Murdoch & Haley, 2002; Coleman, 2002; Robinson, 2001).

South African smallholder farmers have limited access to factors of production, credit and information, and markets are often constrained by inadequate property rights and high transaction costs (Ortmann & King, 2007). In South Africa, credit can be accessed from either the formal or informal financial sector; the formal financial sector is well developed and highly concentrated in urban areas in terms of both available services

---

\* Corresponding author

SAEES – Discipline of Agricultural Economics,  
University of KwaZulu-Natal,  
P. Bag X01, Scottsville 3209, Pietermaritzburg, South Africa  
Email: Baiyegunhil@ukzn.ac.za  
Phone: +2733 260 5437

and the volume of transactions (Mashigo, 2006). The main providers of financial services, especially credit, are the commercial banks. Banks target clients with ownership of relatively high value mortgage-able property; people who possess pay slips as proof of employment and collateral for loans, which many poor smallholder farmers lack. Collateral for the commercial financial sector plays an important role because it ensures repayment if the clients' income is insufficient. In some cases, in addition to collateral are the transaction and administrative costs, interest rates, and the costs of acquiring information about the borrower (Baumann, 2001). Furthermore, the financial intermediaries have not been able to serve their rural clientele easily because it is costly, risky and a difficult task. Local lenders were faced with covariant risks and high transaction costs and therefore became reluctant to lend to the poor (Kuhn *et al.*, 2000). Statistics from the annual FinScope survey revealed that 53 percent (16.4 million) of the South Africa adult population are marginalized or excluded from formal financial services and does not have a bank account. Of those without access, 99 percent are black, 49 percent live in rural areas and 55 percent are women (FinScope, 2005). Placing these statistics in context, the un-banked populace in South Africa are the marginalized poor black people; they form part of the 20 percent of South Africa's population that earns less than US\$1 a day, with many being part of the 30.5 percent officially unemployed (DBSA, 2005).

However, since the advent of democratic governance in 1994, the South African government has in response to some of the perceived market and government failures sought to address these imbalances and deficiencies of previous apartheid government policies, by establishing the Strauss Commission to investigate and make recommendations to the government on the rural financial market in South Africa. A number of proposals were put forward by the Strauss Commission, some of which looked into the access problem and the expansion of the retail financial services in the provinces. Others addressed the national level responsibility for providing capital and support to provincial level institutions. Another set of proposals aimed to structure national level support for rural finance retail institutions is in the form of a Land Bank (Spio, 2006). Despite the implementation of these proposals and the financial sector reforms which include the introduction of new banking laws, liberation of interest rates, and liberation of foreign exchange markets, access to formal credit especially for the poor has not improved.

Although an increasing number of governmental and Non-Governmental Organizations (NGOs) are involved in raising the efficiency of financial intermediaries targeting poor rural households, their effectiveness in improving the poor's access to financial services, especially credit, is below expectations (Schrieder, 2000; Zeller, 2000). As a result, the majority of the poor rural households are left out in the rural financial market. This study investigates the determinants of rural household access to both formal and informal credit markets in the Eastern Cape Province of South Africa. The objective is to provide a better understanding of the smallholder socio-economic characteristics, as they not only influence household's demand for and access to credit but also because potential lenders are most likely to base their assessment of borrowers' creditworthiness on such characteristics.

The remainder of the paper is organized as follows: Section 2 provides a survey of empirical literature on factors that determine household access to credit. Section 3 described the research methods used for the study, while sections 4 and 5 presents the results and discussion of the findings respectively, and section 6 presents the conclusions of the study.

## 2 Empirical evidence of determinants of smallholder farmers' access to credit

Empirical evidence from the literature suggests that household access to financial services both in the formal and informal sectors is influenced by institutional factors, product features and household socio-economic characteristics (Nwana, 1995; Vaessen, 2001). From the institutional perspective, the location of the lender and its conditions for credit allocation greatly influence the probability of access. Dallimore & Mgimeti (2003) showed that long distances and high transportation costs constrained the poor rural household's access to formal financial services mainly located in urban areas. In addition, the cost of information gathering about poor rural households is high. The high costs naturally impede financial markets from making contact with rural people, especially the poor (Schrieder, 2000; Lariviere & Martin, 1999). Rural financial intermediation is expensive because participants are geographically scattered, financial transactions are small and rural incomes are often unstable.

Formal lenders in the credit markets incur high costs in assessing the creditworthiness of small borrowers; yet make low returns due to the small loan amounts in-

volved. The Strauss Commission's investigation indicated that some institutions spend as much as R1, 50 to lend one rand, excluding the cost of capital (Strauss Commission, 1996). This motivates formal lenders to adopt strict collateral requirements as a screening device to minimize default risk, hence keeping small borrowers out of formal credit markets or rationing their credit. Porteous (2003) observed that access to formal financial services in South Africa tends to be limited to salaried workers, therefore excluding the poor, the unemployed, self-employed and informally employed. This is attributed to the fact that most banks demand a pay slip as a pre-condition for account opening. In a study of rural credit accessibility in Northern Nicaragua, Vaessen (2001) showed that at the institutional level, the target group (either women, men or both), the selection criteria of clients, the geographical area of operation, and the features of financial products to be provided to address sustainability concerns, all which influence credit availability, are important factors which lenders based their decision on.

At the household level, borrower characteristics such as the strength of previous business relationships, borrowers' reputation in the market, borrowers' acceptance of interlinked credit contracts, borrowers' debt-service capacity and borrowers' wealth status all influences a household's access to credit (Aleem, 1990; Bell, 1990; Siamwalla *et al.*, 1990). Bell *et al.* (1997) found that interlinked credit contracts and visible household assets have a positive and significant influence on the amount of credit supplied by informal credit agents. Also, low levels of income and asset accumulation put smallholder households at high risk of default which makes them less attractive to formal lenders (Dallimore & Mgimeti, 2003). Access to credit is therefore restricted to a small proportion of the population who can meet the stringent credit requirements, hence leaving most people dependent on informal credit (Okurut *et al.*, 2005). Even lenders in the informal credit markets have designed non-price mechanisms for screening and rationing borrowers in order to reduce risk of loan default (Zeller, 1994). In a study of informal lenders and their clients in Chambar, Pakistan, Aleem (1990) was of the opinion that informal lenders mainly used their established relationship with clients as a screening mechanism. Lenders will generally not entertain loan applications from households with whom they had not had previous dealings either in the form of sale of harvested output or purchase of farm inputs. The longer the period of business relationship, the higher the likelihood that the household will have credit access. This is because business relationships provide the lender with

important information about the potential borrower, including his marketable surplus and the way he conducts his business.

Empirical evidence from the study by Kochar (1997) also showed that the likelihood of access to formal credit is positively and significantly influenced by whether personal guarantee are given for informal loans, especially if personal guarantees can serve as alternative collateral that is valued by informal lenders. The results further revealed that at the household level, being part of the target group or living within the targeted geographical area also influences credit access. Education level, off-farm activities, and access to a network of information and recommendation are all positively and significantly influencing the probability of access to credit. Off-farm activities, captured by a trader dummy, was used as a proxy for repayment capacity while the network of information and recommendation acts as a screening mechanism where potential clients are required to be recommended or guaranteed by existing clients, thereby acting as social collateral.

Access to credit from the Gambian Co-operative, according to Zeller *et al.* (1994), was positively and significantly influenced by age and household income, while being female had a statistically significant negative effect. This result implies that an older person who had control of household resources is likely to be rated to be more creditworthy, while women were discriminated against in the credit market. Clearly defined collateral is often not available and most rural households are less educated than their urban counterparts. In the view of Daniels (2001), collateral requirements are a major determinant of household access to credit, especially in the formal sector. He observed that the low levels of collateral among the poor, to a great extent explained their limited access to financial instruments in the formal financial market.

### 3 Materials and methods

#### 3.1 Study area and data collection

This study was conducted in the Amathole district municipality of Eastern Cape Province of South Africa. It has seven local municipalities namely, Amahlathi, Nxuba, Nkonkobe, Ngqushwa, Great Kei, Mnquma and Mbashe. The estimated population in 2010 is 892,637 people with a total of 252,252 households. According to the Amathole District Municipality Integrated development Plan (ADM, 2012) about 54% of the population are living in poverty in 2010 with about 50.3% of the population earn between R500 and not more than

R3,500 a month. Social grant dependence is higher with about 66 % of the population depending on social grants for sustenance. There is a lack of commitment and support by the banks and financial institutions for the small and emerging enterprises (ADM, 2012).

Primary data were collected through the use of structured questionnaires from a cross section of rural household heads who had applied for credit from the formal sector. Data were collected on households' demographic and socio-economic characteristics as well as on income and expenditure variables. A multistage sampling technique was used to selected representative households for the study (Barnett, 1991). The first stage involved a reconnaissance survey conducted to identify households that have applied for formal credit in three local municipalities namely, Ngqushwa, Amahlathi and Nkokonbe of the Amathole district municipality. These local municipalities were purposively selected because they have large clients of the Eastern Cape Rural Finance Corporation (ECRFC).

The second stage involved random sampling of six villages within these local municipalities from which 25 respondent households each were randomly selected. These areas are Peddie and Hamburg for Ngqushwa local municipality, Stutterheim and Keiskammahoek for Amahlathi local municipality, and Alice and Seymour for Nkokonbe local municipality, in order to get a representative sample of the whole community. Respondents were restricted to those that had applied for credit in the year of the survey.

### 3.2 Conceptual framework

Access to credit is the supply side phenomenon of credit markets, because it is the lenders who decide whether borrowers can access credit or not (Okurut & Schoombee, 2007). The probability of credit access is assumed to be determined by an underlying response variable that captures the true households' socio-economic characteristics and creditworthiness status. The underlying response variable is defined by the regression equation:

$$A_i^* = \sum X_i' \beta + u_i \quad (1)$$

In the equation (1),  $A^*$  is not observable, as it is a latent variable. What is observable is an event represented by a dummy variable which indexes access to credit. If  $A^* > 0$  then  $A = 1$  and  $A^* \leq 0$  then  $A = 0$ . The probability of

access to credit can be represented as follows:

$$\begin{aligned} P_r &= P_r(A_i = 1) = P_r(A^* > 0) \\ &= P_r(X_i \alpha_{i1} + \varepsilon_{i1} > X_i \alpha_{i0} + \varepsilon_{i0}) \\ &= P_r(\varepsilon_{i1} - \varepsilon_{i0} > X_i \alpha_{i0} - X_{i1}) \quad (2) \\ &= P_r(\varepsilon_{i1} - \varepsilon_{i0} > X_i (\alpha_{i0} - \alpha_{i1})) \\ &= P_r(\mu_i > X_i \beta) = F(X_i \beta) \end{aligned}$$

where  $\mu_i = \varepsilon_{i1} - \varepsilon_{i0}$  and  $F(X_i \beta)$  is the cumulative distribution function forestimated at  $X_i \beta$ . The probability that a smallholder farming household will have access to credit is thus a function of the explanatory variables and the unknown error term. If  $\mu_i$  is normal, then  $F$  is the cumulative density function corresponding to the logistic model (Amemiya, 1981).

### 3.3 Empirical model

The logistic regression model was used to determine the factors that have significant influence on the smallholder farmers' access to credit in the study area. This method was chosen because it is a standard method of analysis when the outcome variable is dichotomous (Hosmer & Lemeshow, 2000), measured as having a value of 1 or 0, where 1 = access and 0 = no access. If  $X_i$  represent the set of parameters including socio-economic, farming, institutional factors and location-specific characteristics which influence the access to credit of the  $i$ th farmer. For the farmer,  $A_i^*$  is a latent variable derived from the lender's decision, which is a linear function of  $k$  explanatory variables ( $X$ ), and is expressed as:

$$A_i^* = \beta_0 + \sum_{i=1}^n \beta_i X_{ki} + \varepsilon \quad (3)$$

where  $\beta_0$  is the intercept term, and  $\beta_1, \beta_2, \beta_3, \dots, \beta_i$ , are the coefficients associated with each explanatory variables  $X_1, X_2, X_3, \dots, X_{ki}$ . The credit access decision or the probability that the  $i$ th farmer will have access to credit by the presence of these factors ( $X_i$ ) is given by:

$$P_i = \frac{e^{U_i}}{1 + e^{U_i}} \quad (4)$$

where  $P_i$  denotes the probability that the  $i$ th farmer's access to credit is 1, then  $(1 - P_i)$  is the probability that access to credit is 0. The odds ( $A = 1$  versus  $A = 0$ ) to be used can be defined as the ratio of the probability that a farmer has access to credit ( $P_i$ ) to the probability of non-access ( $1 - P_i$ ) i.e.  $\frac{P_i}{1 - P_i}$ . Taking the natural log, the prediction equation for the  $i$ th farmer is expressed as:

$$A = \ln \left( \frac{P_i}{1 - P_i} \right) = \ln odds = \beta_0 + \sum_{i=1}^n \beta_i X_{ki} + \varepsilon = A_i^* \quad (5)$$

where  $A_i^*$  is also referred to as the log of the odds ratio in favour of credit access.

### 3.4 Variables used in the empirical model

The choice of explanatory variables used was based on theory, previous studies and data availability. Literature has shown that smallholder farmers' access to credit is influenced by host of factors, such as gender, age, educational status, monthly income, security of land rights, value of assets, savings, remittances and pension, dependency ratio, repayment capacity and social capital (Zeller, 1994; Duca & Whitesell, 1995; Godwin, 1998; Fanwell, 2004; Ayamga *et al.*, 2006; Lukytawati, 2009; Oyedele *et al.*, 2009; Essien, 2009; Baiyegunhi *et al.*, 2010; Nwaru *et al.*, 2011; Ibrahim & Bauer, 2013). These factors are important in two ways as they can influence household demand for credit; and potential lenders are likely to base their assessment of borrowers' creditworthiness on these characteristics. Since the explanatory variables included in the logit model are the outcome of *ex-ante* expectations, no unambiguous predictions on the signs of these variables effects on credit access can be made. The explanatory variables and the hypotheses of how each influences credit access are presented in Table 1.

## 4 Results

### 4.1 Socio-economic and demographic characteristics of households

Participation in the credit market could depend on household socio-economic and demographic characteristics such as gender of the household head, marital status, educational attainment, dependency ratio and title deed to land. The socio-economic and demographic characteristics of the sample households are presented in Table 2.

### 4.2 Determinants of household credit access: Logistic regression result

The maximum likelihood method using the SPSS 17.0 was used to estimate the coefficients of the binary logistic regression of the factors influencing smallholder farmers' access to credit. The model fit was tested using the Hosmer & Lemeshow statistics. The overall percentage of correct predictions was 78.9%. The p-value of 0.000 shows that there is a significant difference between the observed and predicted values of the dependent variables, indicating that the model's estimates well fit the data at an acceptable level. The binary logistic regression estimates and the exponential of the logistic regression estimate (which is interpreted as the predicted change in odds for unit increase in the corresponding variable) are presented in Table 3.

**Table 1:** *A priori expectations for the explanatory variables used in the logit model*

<i>Variables</i>	<i>Description/measurement</i>	<i>Expected sign</i>
Gender	D=1 if male; 0 otherwise	+
Age	Age of household head (in years)	+
Education	Years of school attendance	+
Dependency ratio	Ratio of dependants to total household size, expressed as a percentage	–
Monthly income	Monthly household income (in rands)	+
Loan repayment capacity	This is the debt-income ratio	+
Remittances/pension	Total income from remittance/pension (in rands)	+
Savings	Total value of household savings (in rands)	+
Value of assets	Total value of assets (in rands)	+
Security of land rights	D=1 if secured; 0 otherwise	+
Social capital	D=1 if belong to association; 0 otherwise	+
Monthly expenditure	Monthly household expenditure (in rands)	–

Source: Based on *a priori* expectations

**Table 2:** Socio-economic and demographic characteristic of sampled households

Variables	All Farmers (n=150)	Farmers with access (n=106)	Farmers with no access (n=44)	t-test
Gender of household head	0.64 (0.034)	0.65 (0.046)	0.62 (0.074)	0.17 <sup>NS</sup>
Age of household head	44 (0.775)	38 (0.459)	56 (0.939)	2.1 **
Education	8 (0.284)	10 (0.150)	4 (0.438)	0.93 **
Security of land rights	0.93 (0.0204)	0.09 (0.0285)	0.00 (0.000)	0.057 **
Dependency ratio	50 (3.709)	25 (1.571)	111 (5.104)	10.6 **
Monthly income	5,245.00 (180.86)	6,317.72 (159.73)	2,659.09 (132.43)	413.9 **
Repayment capacity	15.76 (0.0432)	8.00 (0.0653)	18.7 (0.986)	2.07 **
Remittance/pension	462.00 (110.19)	566.80 (154.12)	257.72 (48.27)	323 **
Savings	3,089.40 (166.66)	4,268.01 (102.11)	250.00 (38.37)	218 **
Value of assets	24,104.24 (1,569.45)	31,518.36 (1,771.56)	6,242.95 (368.53)	3,619 **
Social capital	0.68 (0.0382)	0.84 (0.0349)	0.27 (0.0679)	0.079 **
Monthly per adult equivalent household expenditure	334.20 (6.81)	369.20 (5.19)	250.00 (12.50)	27.1 **

Standard Error of the means are in parentheses; \*\* Significant at 95 percent level of confidence  
Source: Calculated from field survey data

**Table 3:** Logistic regression estimates of determinants of household access to credit

Variables	B	SE	Significance	Exp( $\beta$ )
Gender	0.413	0.164	0.021 **	1.511
Age	-2.447	0.473	1.034	0.087
Education	0.074	0.086	0.014 **	1.077
Monthly Income	0.432	0.266	0.026 **	1.540
Security of land rights	0.215	3.907	1.055	1.240
Value of Asset	0.254	0.137	0.085 *	1.290
Savings	0.457	0.271	0.068 *	1.580
Remittance, pension & grants	0.005	0.016	0.935	0.994
Dependency ratio	-0.288	0.068	0.002 ***	0.750
Repayment capacity	1.792	0.584	0.006 ***	0.167
Social capital	0.463	0.193	0.015 **	1.589
Household expenditure	0.201	0.448	0.214	1.223
Local municipality:				
Nkokonbe	0.604	4.197	0.734	1.830
Amahlathi	0.518	6.997	0.374	1.679
Ngqushwa	0.508	7.359	0.592	1.661
Constant	1.103	0.134	8.209	3.013

Number of observation: 150; Hosmer & Lemeshow Test:  $\chi^2 = 114.502$ ; d.f=14; Sign=0.000;  
-2log likelihood = 90.51; Nagelkerke  $R^2 = 0.69$ ; Overall accuracy (correctly predicted): 78.9 %

Note: \*\*\*, \*\* and \* denote statistical significance at the 1 %, 5 % and 10 % probability levels, respectively.

## 5 Discussion

Households' demographic, socio-economic and farm characteristics play a major role in determining their access to credit. Age is considered an important variable in terms of experience and responsibility. About 64 % of the smallholder farmers are male, also about 65 % of the smallholder farmers with access to credit are male. Age is an important determinant of household access to credit because most credit institutions lend to the economically active group (Fanwell, 2004). The average age of the smallholder farmer is 44 years, and 38 years for those with access to credit, while those without access to credit are on the average 56 years old. The results show that these age groups were within the ages defined as economically productive in a population (ILO, 2006). The dependency ratio gives insight into the number of people of non-working age compared to the number of those of working age. A high ratio means those of working age face a greater burden in supporting the dependents. The average dependency ratio for the smallholder farmer is about 50 %. The dependency ratio tends to be lower (25 %) on average for households with access than for those without access (about 111 %).

Education represents both the scope of the productive opportunities open to the household and its ability to deal with the formality of loan evaluation procedures. The smallholder farmers have an average of 8 years of schooling. Smallholder farmers having access to credit tend to have higher levels of education (10 years) than those without access to credit (4 years). Land is the primary asset of smallholder farmers. The majority of the farmers (about 93 %) claimed they do not have secured land rights. Only about 9 % of farmers having access to credit feel their land rights are secured.

The average monthly income for the smallholder farmer is R5,245. It is R6,318 and R2,659 for farmers with access to credit and those without respectively. The average income received by smallholder farmer monthly as remittances, grants or pension payments is R462. It is R547 and R258 for farmers with access to credit and those without respectively. The smallholder farmers' average repayment capacity measured as the debt-income ratio is 15.7. This 8 and 19 for farmers with access to credit and those without respectively. The average savings for the entire households sampled is R3,089. For households with access to credit the average savings is about R4,268 and only R250 for those households without access to credit. The average value of the productive assets (mainly oxen, poultry and livestock) owned by a smallholder farmer was estimated to be R24,104. For those with access to credit it was esti-

mated at R31,518, compared to R6,243 for those without access. The average household monthly expenditure per adult equivalent was about R334. For those with access to credit it was estimated at R369 and R250 for those without access.

Majority (68 %) of the smallholder farmers are members of association/cooperatives. About 84 % of those with access to credit and only 27 % of those without access are members of association/cooperatives. Also, about 93 % of the smallholder farmers felt their land rights are not secured. Only 9 % of those with access to credit felt their land rights are secured. The major source of credit is from the formal sector; 76 % of smallholder farmers obtained credit from formal sources, mainly from the Eastern Cape Rural Finance Corporation (ECRFC); while 24 % of the farmers obtained their credit from friends, families and relatives. No farmer indicated receiving credit from non-governmental organisations (NGOs).

The result presented in Table 3, show a statistically significant positive relationship between gender and smallholder farmers' access to credit. The odds ratio for gender is 1.511, implying that a male farmer is more likely to have access to credit 1.5 times the odds of a female farmer. This finding is consistent with *a priori* expectations, and may be a reflection of the bias against rural women, as household resources are thought to be mainly controlled by men, thus lenders perceived men as more creditworthy. Previous credit access studies have found that women are less likely to obtain credit from informal markets (Zeller *et al.*, 1994).

Education has a statistically significant positive effect on smallholder farmer access to credit, i.e. educated farmers are more likely to have access to credit. The odds ratio for education is 1.077, implying that one more year of education increases the probability of access to credit by 1. This is consistent with *a priori* expectation and the findings of Ayamga *et al.* (2006); Lukytawati (2009); Nwaru *et al.* (2011). Education improves the capability for resourcefulness and invention. It enables households in the rural area to adapt to new agricultural methods, cope with risk, and respond to market signals and consequently improve agricultural productivity (Ibrahim & Bauer, 2013).

Household income has a statistically significant positive effect on smallholder farmer access to credit, i.e. the higher the households' monthly income, the more likely that a credit agent will lend to it. The odds ratio for household income is 1.540, implying that an increase in households' income increases the probability of accessing credit by 1.54 times. This is consistent with *a pri-*

*ori* expectation and the findings of Nto (2006), Essien (2009), Oboh & Kushwaha (2009), and Nwaru *et al.* (2011). Higher level of household income implies a greater repayment capacity and may serve as a measure of creditworthiness, thus households with more income are more likely to have their credit demand met.

The value of productive assets has a statistically significant positive effect on smallholder farmer access to credit, i.e. the higher the value of assets, the more likely that a credit agent will lend to a smallholder farmer. The odds ratio for value of asset is 1.290, implying that an increase in the value of assets increases the probability of accessing credit by 1.29 times. This is consistent with *a priori* expectation and the findings of Nuryatono (2005), Oyedele *et al.* (2009), and Duca & Whitesell (1995). The rationale for this is that lenders could see the client's assets as important indicator of consumers' repayment capacity or the last resort to liquidate to recover the credit in case of loan default.

Household savings has a statistically significant positive influence on smallholder farmer access to credit, i.e. the higher the households' savings, the more likely that a credit agent will lend to it. The odds ratio for households savings is 1.580, implying that an increase in households' income increases the probability of accessing credit by 1.58 times. This is consistent with *a priori* expectation and the findings of Nwaru *et al.* (2008), Fengxia *et al.* (2010), and Nwaru *et al.* (2011). Higher level of households' saving could be substituted for collateral, especially if savings are deposited with the financial institution providing the credit.

Dependency ratio has a statistically significant negative influence on smallholder farmer's access to credit. This implies that the probability of having access to credit declines with increasing households' dependency ratio. The odds ratio for households dependency ratio is 0.750, implying that an increase in households dependency ratio decreases the probability of accessing credit by 0.75 times. A high dependency ratio exerts consumption stress on the household and lenders might be averse to lending to such households because of fungibility of credit, i.e. the credit might be channeled towards other uses rather than its intended productive purposes. Dependency ratio as a proxy for risk-bearing capacity confirms that the higher the number of dependent household members, the more likely that the household are to suffer risk. By implication, households with a high dependency ratio would be judged by lenders to be less creditworthy.

Social capital has a statistically significant positive effect on influence on smallholder farmer's access to

credit, i.e. farmers who are members of associations/groups are more likely to have access to credit. The odds ratio for social capital is 1.589, implying one more group membership increases the probability of credit access by about 2 times. Participation in group activities and being connected to social systems proved to be positively associated with access to financial services (Lukytawati, 2009), and also because the guarantors of credit for smallholder farmers sign an undertaking with the financial institutions, they monitor and exert pressure on the borrowers to ensure the full repayment of the loan when due. Borrowers who have access to this type of social capital are more likely to have credit access. Group based lending is a way of circumventing adverse selection and moral hazard issues (Armendáriz & Morduch, 2005).

Loan repayment capacity (measured as debt-income ratio) has a statistically significant negative influence on smallholder farmer's access to credit. This implies that the probability of having access to credit declines with increasing debt-income ratio. The odds ratio for loan repayment capacity is 0.167, implying that an increase in debt-income ratio decreases the probability of accessing credit by 0.167 time. A possible explanation for this result is, the higher the debt-income ratio the higher the exposure to loan default risks which reduces the probability of credit access.

## 6 Conclusion and implication for policy

The aim of this study was to determine the factors influencing smallholder households' access to credit in Amathole district municipality, Eastern Cape, South Africa. Useful findings have emerged that provides insight on the pathways to increase the smallholder farmers' access to credit. The result of the logistic regression model indicates that gender, education, income, savings, dependency ratio, repayment capacity and social capital, are statistically significant in explaining smallholder farmers' access to credit in the study area.

Therefore, there is need for policy makers and private sectors to develop policies aimed at increasing rural farmer's educational attainment through better access to technical information, extension and training. Skill training, provision of marketing and business development services will increase household income and agricultural productivity. With increasing income and as changes occur in the educational status of rural farmers (especially women), the opportunity cost of their time in raising children increases. This will also reduce the high dependency ratio in most households. The result



that male farmers have higher likelihood of accessing credit than female farmers, do suggest the need to develop more appropriate options for women. Women suffer several constraints to the use of sustainable agricultural practices and household resources. Efforts are needed to reduce the gender gap in the access to credit.

Also policies that work to alleviate financial constraints of smallholder farmers should be formulated. There is need for the promotion of sustainable financial markets in rural areas, where farmers' savings can be deposited safely and profitably. The absence of banking institutions has encouraged farmers to invest in unproductive assets like cattle. Sustainable lending requires savings with the rural banks; this will enhance smallholder farmers' loan repayment capacity. Furthermore, government and private sectors should come up with mechanisms that will make the supply of credit free from gender and political bias. They could enhance smallholder access to credit appropriately with a better understanding of the nature and objectives of the existing social groups/networks in rural areas and use them for project designs and farm credit delivery.

#### Acknowledgements

This research was supported by study bursary from the Govan Mbeki Research and Development Centre (GMRDC), University of Fort Hare. The opinions and conclusions expressed are those of the authors and do not necessarily represent the views of GMRDC.

#### References

- ADM (2012). Amathole District Municipality Integrated Development Plan. 2012/2013. Amathole District Municipality (ADM). URL <http://www.amathole.gov.za/.../Draft%20IDP%202013-2014%20> accessed on 23/08/2013.
- Adugna, T. & Heidhues, F. (2000). Determinants of farm households access to informal credit in Lume district, central Ethiopia. *Savings and Development*, 24 (4), 27 – 46.
- Aleem, I. (1990). Imperfect information, screening, and the costs of informal lending: a study of a rural credit market in Pakistan. *The World Bank Economic Review*, 4 (3), 329 – 349.
- Amemiya, T. (1981). Qualitative response model: a survey. *Journal of Economic Literature*, 19 (4), 1483–1536.
- Armendáriz, B. & Morduch, J. (2005). *The economics of microfinance*. Massachusetts Insitutute of Technology Press. Pp. 25–30.
- Ayamga, M., Sarpong, D. B. & Asuming-Brempong, S. (2006). Factors influencing the decision to participate in microcredit programmes: an illustration for Northern Ghana. *Ghana Journal for Development Studies*, 3 (2), 57–65.
- Baiyegunhi, L. J. S., Fraser, G. C. G. & Darroch, M. A. G. (2010). Credit constraints and household welfare in the Eastern Cape Province, South Africa. *African Journal of Agricultural Research*, 5 (16), 2243–2252.
- Barnett, V. (1991). *Sample survey: principles and methods*. Edward Arnold, London.
- Baumann, T. (2001). Microfinance and poverty alleviation in South Africa. Unpublished Report, Bay Research and Consultancy Services, Cape Town.
- Bell, C. (1990). Interaction between institutional and informal credit agencies in rural India. *World Bank Economic Review*, 4 (3), 297 – 327.
- Bell, C., Srinivasan, T. N. & Udry, C. (1997). Rationing, spillover and interlinking in credit markets: The case of rural Punjab. *Oxford Economic Papers*, 49, 557 – 585.
- Binswanger, H. P. & Khandker, S. R. (1995). The impact of formal finance on the rural economy of India. *Journal of Development Studies*, 32 (2), 234 – 262.
- Coleman, B. E. (2002). Microfinance in Northeast Thailand: who benefits and how much? Asian Development Bank-Economic and Research Department Working paper 9. Asian Development Bank, Manila, Philippines.
- Dallimore, A. & Mгимети, M. (2003). Democratic banking in the new South Africa: challenging contemporary banking practices at grassroots. Unpublished Report, Durban: Development Research Africa.
- Daniels, R. C. (2001). Consumer indebtedness among urban South African households: a descriptive overview. Working Paper No 01/55. Development Policy Research Unit, University of Cape Town.
- DBSA (2005). Development report. Overcoming underdevelopment in South Africa's second economy. Development Bank of Southern Africa (DBSA).
- Duca, J. V. & Whitesell, W. C. (1995). Credit Cards and Money Demand: A cross-sectional Study. *Journal of Money, Credit, and Banking*, 27 (2), 604–623.
- Essien, U. A. (2009). *Gender, informal credit markets and determinants of credit use by food crop farmers in*

- Akwa Ibom State of Nigeria*. Master's thesis Michael Okpara University of Agriculture, Umudike, Nigeria.
- Fanwell, K. B. (2004). Determinants and characteristics of household demand for smallholder credit in Malawi. General Economics and Teaching 0408001, EconWPA. URL <http://129.3.20.41/eps/get/papers/0408/0408001/.pdf> assessed on 06/07/2013.
- Fengxia, D., Jing, L. & Featherstone, A. M. (2010). Effects of credit constraints on productivity and rural household income in China. Working Paper 10-WP 516, Centre for Agricultural and Rural Development, Iowa State University.
- FinScope (2005). Survey highlights including FSM Model. Finmark Trust. South Africa. URL <http://www.finmark.org.za> assessed on 06/11/2013.
- Godwin, D. D. (1998). Household debt quintiles: Explaining changes 1983–1989. *The Journal of Consumer Affairs*, 32 (2), 369–393.
- Hosmer, D. & Lemeshow, S. (2000). *Applied logistic regression. 3rd Edition*. A Wiley-Interscience Publication. New York.
- Ibrahim, A. H. & Bauer, S. (2013). Access to micro-credit and its impact on farm profit among rural farmers in dryland of Sudan. *Global Advances Research Journal of Agricultural Science*, 2 (3), 88–102.
- ILO (2006). *Economically active population, estimation and projections, 1980–2020. 5th Edition*. International Labor Organization (ILO), Geneva.
- Khandker, S. R. (2003). Microfinance and poverty: Evidence using panel data from Bangladesh. World Bank Policy Research Working Paper 2945. Washington D.C.: World Bank.
- Kochar, A. (1997). An Empirical Investigation of Rationing Constraints in Rural Credit Markets in India. *Journal of Development Economics*, 53, 339 – 371.
- Kuhn, M. E., Darroch, M. G., Ortmann, G. F. & Graham, D. H. (2000). Improving the provision of financial services to micro-entrepreneurs, emerging farmers and agribusiness: Lessons from KwaZulu-Natal. *Agrekon*, 39 (1), 68 – 81.
- Lariviere, S. & Martin, F. (1999). Innovations in rural finance: the challenge of sustainability and outreach. A paper presented at the 3rd annual seminar on new development finance. Geothe Universitat and Ohio State University, Frankfurt.
- Lukytawati, A. (2009). Factors influencing participation and credit constraints of financial self-help group in remote rural areas: the case of ROSCAS and ASCRA in Kemang Village, West Java. *Journal of Applied Sciences*, 9 (11), 2067–2077.
- Mashigo, P. (2006). The debt spiral in the poor households in South Africa. *International Indigenous Journal of Entrepreneurship, Advancement, Strategy and Education. Online Edition*, 2(1). Assessed on 10/09/2013 URL <http://www.indigenousjournal.com/IIJEASVol1111Iss1Mashigo.pdf>.
- Murdoch, J. & Haley, B. (2002). Analysis of the effects of microfinance on poverty reduction. New York University (NYU) Wagner Working Paper No 1014. New York. URL [http://pdf.wri.org/ref/morduch\\_02\\_analysis\\_effects.pdf](http://pdf.wri.org/ref/morduch_02_analysis_effects.pdf) assessed on 06/07/2013.
- Nto, P. O. O. (2006). *Analysis of rural farmers' credit worthiness and procurement potentials under quoted banks in Abia State, Nigeria*. Master's thesis Michael Okpara University of Agriculture, Umudike, Nigeria.
- Nuryatono, N. (2005). *Impact of smallholder's access to land and credit markets on technology adoption and land use decision: The case of Tropical Forest Margins in Central Sulawesi*. Ph.D. thesis Institute of Human Development. Georg-August University of Göttingen.
- Nwanna, G. I. (1995). Financial accessibility and rural sector development. *Savings and Development. Savings and Development*, 19 (4), 453 – 491.
- Nwaru, J. C., Essien, U. A. & Onuoha, R. E. (2011). Determinants of informal credit demand and supply among food crop farmers in Akwa Ibom State, Nigeria. *Journal of Rural and Community Development*, 6 (1), 129–139.
- Nwaru, J. C., Onyenweaku, C. E. & Nwagbo, E. C. (2008). Interest rate, farm credit demand and supply; their determinants and implications for rural credit markets in Imo State of Nigeria. *Journal of Agriculture and Food Science*, 3 (2), 137–149.
- Oboh, V. U. & Kushwaha, S. (2009). Socio-economic determinants of farmers' loan size in Benue State, Nigeria. *Journal of Applied Sciences Research*, 5 (4), 354–358.
- Okurut, F. N. & Schoombe, A. (2007). Credit market access in Uganda: evidence from household survey data 1999/2000. *South Africa Journal of Economic and Management Sciences*, 10 (3), 371 – 383.

- Okurut, F. N., Schoombee, A. & van der Berg, S. (2005). Credit demand and credit rationing in the informal financial sector in Uganda. *South Africa Journal of Economics*, 73 (3), 482 – 497.
- Ortmann, G. F. & King, R. P. (2007). Agricultural cooperatives II: Can they facilitate access of small-scale farmers in South Africa to input and product markets? *Agrekon*, 46 (2), 219–244.
- Oyedele, G. A., Akintola, J. O., Rahji, M. A. Y. & Omonona, B. T. (2009). Credit constrained condition of farm households and profitability of agricultural production in Nigerian agriculture. *Agricultural Journal*, 4 (4), 192–201.
- Parker, J. & Nagarajan, G. (2001). Can microfinance meet the poor's needs in times of natural disaster? Microenterprise Best Practices, Development Alternatives, Inc., US Agency for International Development USAID, DAI.
- Porteous, D. (2003). The landscape of access to financial services in South Africa. Labor markets and social frontiers No. 3. South Africa Reserve Bank, Pretoria.
- Robinson, M. (2001). *The microfinance revolution: sustainable finance for the poor*. Washington DC: IBRB/World Bank.
- Rosenzweig, M. R. (2001). Savings behaviour in low-income countries. *Oxford Review of Economic Policy*, 17 (1), 40–45.
- Schrieder, G. B. (2000). Improving bankability of small farmers in northern Vietnam. *Savings and Development*, 24 (4), 385–402.
- Sharma, M. (2000). The scope of policy reforms in rural microfinance. Policy Brief No 14: Rural Financial Policies for Food Security of the Poor. Washington D. C.: International Food Policy Research Institute.
- Siamwalla, A., Pinthong, C., Poaponsakorn, N., Satsanguan, P., Nettayarak, P., Mingnaneenakin, W. & Tubpun, Y. (1990). The Thai rural credit system: Public subsidies, Private information and segmented markets. *World Bank Economic Review*, 4 (3), 271–269.
- Spio, K. (2006). The Impact and accessibility of agricultural credit: a case study of small-scale farmers in the Northern Province of South Africa. Unpublished PhD Thesis. University of Pretoria, South Africa.
- Strauss Commission (1996). Interim report of the commission of enquiry into the provision of rural financial services. RP38/1996. ISBN 0-621-26972-7.
- Vaessen, J. (2001). Accessibility to rural credit in Northern Nicaragua: the importance of networks of information and recommendation. *Savings and Development*, 25 (1), 5–31.
- Zeller, M. (1994). Determinants of credit rationing: a study of informal lenders and formal credit groups in Madagascar. *World Development*, 22 (12), 1895–1907.
- Zeller, M. (2000). Product innovation for the poor: the Role of microfinance. Policy Brief No 3: Rural Financial Policies for Food Security of the Poor. Washington DC: International Food Policy Research Institute.
- Zeller, M., Braun, J. V., Johm, K. & Puetz, D. (1994). Sources and terms of credit for the rural poor in the Gambia. *Africa Review of Money Finance and Banking*, 1, 167–186.