DETERMINANTS OF ACCESS TO BANK CREDIT BY SMALLHOLDER FARMERS: EVIDENCE FROM SOUTH AFRICA

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ABSTRACT

Access to bank credit by smallholder farmers remains a confounding problem. A grasp of the importance of financial soundness by smallholder farmers as a precondition for access to finance will improve the probability of approvals of applications for bank credit holding other factors constant. The purpose of this paper was to examine the factors that influence access to bank credit by smallholder farmers. Cross-sectional data obtained from a survey of 362 smallholder farmers selected from Mpumalanga and North West provinces was applied for this study. Data was analysed using descriptive statistics, bivariate correlation analysis and multiple regression. The coefficients for the capital structure of the farmer, family networth and household income were observed to positively and significantly influence the farmer's access to bank credit. However, the coefficient for collateral was found to be negative albeit insignificant. The analysis of variance (ANOVA) confirmed that the model had a good fit to the data. The results of this study have policy implications for lenders and borrowers. This article is the first to examine the nexus between the capital structure of smallholder farmers and access to bank credit in South Africa. Previous studies have focused on other sectors. Thus, this paper has demonstrated that smallholder farmers need to be financially sound in order to improve their chances of accessing bank credit.

Keywords: Bank Credit, Smallholder Farmers, Financial Structure, Networth, South Africa.

BACKGROUND

In South Africa primary agriculture contributes about 3% to gross domestic product (GDP). When compared to other sectors, agriculture contributes less to aggregate gross domestic product. Various reasons for this poor performance have been advanced in the literature (Chisasa, 2015). These range from erratic rainfall, limited farm land size, lack of advanced technologies to poor management skills. Chisasa and Makina (2012) demonstrated that the agricultural sector receives less credit from formal financial institutions when compared to private sector non-farm borrowers. Subsequently, the authors provided evidence that the relationship between bank credit and agricultural output is positive and significant (Chisasa and Makina, 2013; Chisasa, 2015). What has also emerged from empirical literature is that in South Africa, smallholder farmers are credit constrained resulting in their poor performance (Coetzee et al, 2002, Wynne and Lynne, 2003, Chisasa and Makina. 2012). Numerous studies outside South Africa have examined and demonstrated that credit constrained farmers are less productive than those with access to credit. For instance, Briggerman et al. (2009) demonstrated that the value of production is significantly lower for credit-constrained sole proprietorships in the United States of America (USA).

Credit is needed for both farming purposes and as bridging finance for family and consumption expenses especially between the planting and harvest periods. Thus, lack of access to credit by farmers negatively affects productivity. Olagunje and Ajboye (2010) opine that one of the reasons for the poor contribution of agriculture to gross domestic product (GDP) is lack of access to credit due to a paucity of credit institutions which can assist farmers. Furthermore, the absence of rural banks or their reluctance to give credit to rural farmers mainly explain the extensive influence of informal lending institutions on agricultural production in the rural areas. Similar observations for South Africa were made by Chisasa (2014), concluding that commercial banks give bank loans to fewer smallholder farmers than nonbank credit institutions.

The rate at which the world population is expanding, and lessons learnt from the 2008 global financial crisis make it important for research to be conducted on how farmers can access more bank credit in order to boost productivity. Poor people spend 50 to 70% of their income on food and have little capacity to adapt as prices rise and wages for unskilled labour fail to adjust accordingly (Von Braun, 2008). Rural credit has proven to be a powerful instrument against poverty alleviation. Farmers particularly need credit because of the seasonal pattern of their activities and the uncertainties they are facing (Ololade and Olagunju, 2013).

Further studies have attempted to provide evidence of what influences access to credit by smallholder farmers. For instance, availability of collateral, good cash flows, age of the farmer, land size and the quality of management, have been found to enhance the farmer's probability of loan applications being approved by the lenders. Despite the abundance of empirical studies that provide evidence of the factors that influence access to formal bank credit by smallholder farmers, there appears to be no improvement in the supply of credit to smallholder farmers. Furthermore, studies that have examined the leverage effect of the agricultural firm's capital structure on access to formal bank finance are scant. This paper extends previous studies by testing the relationship between capital structure and access to bank credit by smallholder farmers in South Africa.

Following on the problem of credit access elucidated above, the primary objective of this paper is to determine the factors that influence access to formal bank credit by smallholder farmers in South Africa. Two secondary objectives flow from the primary objective. First, this study examines the socio-economic characteristics of the rural farmers in South Africa. Secondly, the paper attempts to determine the role of capital structure in the approval of loan applications in South Africa.

The rest of the paper proceeds as follows. Section 2 presents the literature review upon which this paper is premised. Section 3 outlines the research methodology used in the study. The results of the study are presented in Section 4 while Section 5 concludes.

LITERATURE REVIEW

Theory of Credit

Joseph (2013) defines credit as "*a transaction between two parties in which one (the creditor or lender) supplies money, goods, services or securities in return for a promise of future payment by the other (the debtor or borrower)*". While credit has benefited many economies, the practice has been characterised by both borrower's and lender's risk (Wolfson, 1996). Lender's risk refers to moral hazard. It supports an asymmetric information perspective, which assumes that the borrower has more information than the lender concerning the possibility of voluntary default (Wolfson, 1996). Thus in order to minimise borrower default probabilities, lenders assess

the obligor characteristics which determine the decision whether or not to approve a credit application.

Factors That Influence Access to Credit

Factors observed to influence access to bank credit by smallholder farmers include collateral, farm size, household income, family networth and demographic characteristics.

Capital Structure

Capital structure is defined in Zhangfei and Lansik (2006) as a combination of debt and equity capital maintained by a firm. An optimal capital structure is considered to be one that will reduce a firm's cost of capital while at the same time maximising shareholder wealth. It includes other sources of finance. Examples are retained earnings and preference shares available to the firm. The capital structure of a firm has been documented more for corporate non-agricultural than for agricultural firms. In agriculture, the role of credit is closely related to providing resources which farmers cannot source from their own internal capital (equity). Credit (or debt capital) facilitates access to resources which farmers require for their operations. When applying free cash flow theory, Jensen (1986) opines that if a firm is left with excessive cash flow and little debt, management tends to behave with laxness and may choose investment projects that are not profitable, or simply yield lower than expected returns.

However, financial slack implies higher borrowing capacity that may serve as a cushion to stabilise business operation in a risky environment (Zhangfei and Lansik, 2006). In agriculture, for example, higher borrowing capacity may be important to address seasonal needs or counteract market volatilities due to disease outbreaks or extreme weather conditions.

Collateral

The size of the farm plays a significant part in the formal loan-decision process, as it provides much-needed collateral. In Pakistan, Akram et al. (2008:5) observed that the demand for credit was minimised by unacceptable or inadequate collateral. Land was the most readily acceptable form of collateral and this prevented a large number of tenants and landless people from participating in the formal credit markets. Approximately 77% of farmers used agricultural land as collateral because it was the most acceptable form of collateral by all institutional lenders. Khan and Hussain (2011) concluded that by increasing the size of the farm from small-scale to large-scale, the demand for formal credit is enhanced.

Empirical evidence suggests that land is the only collateral acceptable to institutional sources of credit. Thus, subsistence farmers are left out of the credit programmes (Akram et al. 2008). It is worth noting that in agriculture, land quality and the size of the operational area are factors that affect the productive capacity of the farm and imply an increase in the income generated (Swain, 2007). Although it seems that these factors affect creditworthiness positively, Swain argues that many formal and some informal lenders make their judgement of the creditworthiness of households primarily on the basis of the amount of land they own. This is supported by the fact that the quality of land and the proportion of irrigated area are statistically insignificant. In this regard, Yaslioglu et al. (2009) concluded that in Turkey, the scattered, fragmented plots in agricultural areas are one of the major problems preventing agricultural efficiency. Such inefficiency may also constrain smallholder farmers from accessing both short-

and long-term credit needed for financing working capital and fixed improvements on the farm and machinery.

Family Networth

The variable family networth represents the difference between the farmer's total assets and total liabilities at a given point in time. A farmer whose networth is high is likely to get a favourable decision from the lender, otherwise not (Briggerman et al., 2009).

Family Income

Measures of financial well-being, including household income consistently reduce the probability of being denied credit. The anticipated income of the farmer is one of the factors which influence the lender to grant credit. The farmer's income acts as a good predictor of the farmer's ability to repay the loan (Kashuliza and Kydd, 1996). In fact more liquidity lowers the probability of being denied credit (Briggerman et al., 2009).

METHODOLOGY

Study Area

This study was carried out in Mpumalanga and North West provinces of South Africa. South Africa consists of nine provinces. The two provinces were selected because they have a high maize production capacity. Maize is the staple food of South Africa. Thus these two provinces have a large role to play by contributing to alleviating food insecurity in South Africa. The Free State province is the other and only province producing more maize than Mpumalanga and North West provinces. However, it was excluded from this study due to limited financial resources required to contact such an extensive study. Nevertheless, its exclusion does not compromise the representativeness of the selected provinces because of their significant contribution to South Africa's agricultural gross domestic product (AGDP).

Sampling Strategy and Data Collection

A multi-stage sampling strategy was used to select 500 respondents from the provinces under study. In the first stage the two provinces were selected because of their high contribution to South Africa's agricultural output. Two out of three districts were randomly selected from Mpumalanga province while 3 out of five districts were randomly selected from North West province. In the final stage 100 farmers were randomly selected. A total of 500 farmers made up the final sample for this study.

Analytical Techniques

First, data was analysed using descriptive statistics in order to gain an understanding of the socio-economic characteristics of the farmers. Second the study hypothesised the farmers' access to credit and applied multiple regression using ordinary least squares (OLS) to estimate the impact of the identified exogenous variables on access to credit.

Model Specification

On the basis of the literature reviewed and summarised above, the credit access function is summarised and presented below as Equation [1].

Credit Access (ACVolume) = *f*(Capital structure (CS); Household income (HI); Collateral (C); Family networth (FN)) [1]

From the above credit access function, the following regression model for credit access was estimated and presented as Equation [2].

$$ACVolume = \beta_0 + \beta_1 CS + \beta_2 HI + \beta_3 C + \beta_4 FN + \varepsilon_t \quad [2]$$

Where: $\beta_0 - \beta_5$ are coefficients of determination

ε_t is the error term

Survey data involving 362 out of 500 sampled smallholder farmers from Mpumalanga and North West provinces was used for the study. In this instance, a dummy variable was introduced for capital structure. Respondents who accessed credit were represented by 1 (one) and those who did not by 0 (zero). Responses 2–5 (representing the scale of credit accessed by loan size) for questions 21 (short-term debt) and 22 (long-term debt) were first combined and transformed to 1, while response 1 was transformed to zero in order to generate a binary response system. Both questions 21 and 22 for credit accessed were combined, as they relate to short-term and long-term credit respectively. The purpose of combining the two questions was to determine the aggregate leverage effect on access to credit.

EMPIRICAL RESULTS AND DISCUSSION

Socio-Economic Characteristics of Farmers

The respondents were asked to indicate their gender. A total of 235 farmers (65%) were male while 125 farmers (35%) were female. This shows that farming in South Africa is still dominated by man. However, women are making inroads into a sector that has historically been male-dominated. Male dominance in this sector may be attributed to the intensive labour requirement (Ololade and Olagunju, 2013). The respondents were either single (28.7%) or married (48.6%). Others were widowed (12.2%), divorced (4.4%) or separated (6.1%). Largely, the results suggest that many families are relying on farming for employment and hence their livelihood. Results show that the majority (39.5%) fall in the 35-40 years age group. The study also shows that there are young people who are involved in farming. An examination of the level of education of the farmers revealed that 77.1% either completed primary school (37.3%) or high school (39.8%). Only 3.6% received university education and 4.7% had college education. By and large, the survey revealed that smallholder farmers lack education at a high level. Table 1 below summarises the demographic characteristics of the smallholder farmers surveyed for this study.

Table 1 DEMOGRAPHIC CHARACTERISTICS OF FARMERS		
Parameter	**Frequency**	**Percentage (%)**
Gender		
Male	235	65
Female	125	35
Total	362	100
Marital status		
Single	104	28.7
Married	176	48.6
Widowed	44	12.2
Divorced	16	4.4
Separated	22	6.1
Total	362	100
Age		
20-30	44	12.2
31-40	58	16.0
41-50	116	32.0
Over 50	144	39.8
Total	362	100
Educational level		
University graduate in agriculture	13	3.6
College graduate in agriculture	17	4.7
National Senior Certificate	144	39.8
Primary school	135	37.3
Did not go to school	53	14.6
Total	362	100.0

Descriptive Statistics

Respondents were asked to indicate the amount of credit received during the previous agricultural season. Credit received was found to be less than R100 000 (Mean score = 1.38); N=362). Household income ranged from R15 000 to R20 000 per annum (Mean score=1.78; N=362). Family networth was also in the range of R10 000 to R15 000 (Mean score=1.80; N=362). Respondents indicated that they use personal property as collateral (Mean score=3.93; N=362). However, in some instances guarantees are used or that no collateral is provided at all (Standard deviation=1.4). The summarised descriptive statistics are provided in Table 2 below.

Table 2 DESCRIPTIVE STATISTICS				
	Question	**Mean**	**Std. Deviation**	**N**
Credit received	How much credit did you receive last season?	1.38	0.877	362
Household income	Please indicate your household income in Rands for the previous season.	1.78	1.172	362
Capital structure	Capital structure (1 = received credit; 0 otherwise)	0.4448	0.49763	362
Family networth	What was the family's networth at the beginning of the last agricultural season?	1.80	1.189	362
Collateral	What form of collateral have you offered or would you offer to your bank/lender?	3.93	1.423	362

The majority (241 or 89.4%) of respondents received less than R100 000 credit during the last agricultural season, 9.6% (29) received between R100 001 and R150 000 while only 10.6% (35) accessed over R150 000. In light of the escalating input prices and average land size of over 15 hectares, these credit facilities are insufficient to run the farming business profitably.

Correlation Analysis

Table 3 below shows that access to credit has a positive relationship with capital structure (proxied by debt and equity), income and collateral.

The Pearson correlation coefficient is significant (1-tailed) for all variables.

Table 3
PEARSON CORRELATION MATRIX

	Credit received	Household income	Capital structure	Family networth	Collateral
Credit received	1.000				
Household income	0.300***	1.000			
Capital structure	0.223***	0.176***	1.000		
Family networth	0.279***	0.449***	0.264***	1.000	
Collateral	-0.165***	-0.207***	-0.414***	-0.255***	1.000

*, **, *** denote significance at 10%, 5% and 1% respectively.

Chi-Square Test

The results of the Chi-Square test are presented in Table 4. All variables have a strong association at 95% confidence level ($p<0.05$). Therefore, it can be concluded that farmers with high income, hold collateral and have low gearing have a high probability of accessing credit from banks and other similar credit suppliers.

Table 4
CHI-SQUARE TESTS BETWEEN CREDIT ACCESSED AND PREDICTORS

Item No	Relationship	Pearson Chi-square		
		Value	df	Assmp. Sig (s-sided)
1	Collateral and credit accessed	75.779	16	000***
2	Capital structure and credit accessed	41.646	4	000***
3	Networth and credit accessed	66.920	16	000***
4	Income and credit accessed	42.284	16	000***

*; **; *** denotes significance at 1%, 5% and 10% respectively.

Regression Analysis

This section presents the regression results for the study. Table 5 shows that the independent variables have strong explanatory power. Both R-squared (13.7%) and Adjusted R-Squared (12.7%) are significant. Furthermore, the Durbin Watson statistic of 1.796 (approximately 2) is acceptable, showing evidence of a high level of isolation among independent variables. The ANOVA shows that the model is reliable and significant in explaining the relationship between access to credit as the dependent variable and the explanatory variables, ($p<0.05$); $F=14.173$.

As shown in Table 5, all coefficients except for collateral are positive and significant. A 1% increase in the level of household income results in a 20.6% chance of access to credit ceteris paribus. Furthermore, capital structure is observed to influence access to credit significantly ($p<0.05$). The family networth is also found to have a significant impact on the smallholder farmer's access to credit facilities. Lack of collateral by most smallholder farmers was, as expected, seen to have a negative coefficient albeit insignificant.

These results suggest that banks focus on the viability of the credit proposal as a source of loan repayment. Emphasis is placed on the level of income from which the capital sum and interest can be repaid. Furthermore, consideration is made of the level of gearing, the level of debt when compared to equity, of the prospective borrower on deciding whether to sanction credit facilities or not. The lower gearing, the higher the probability of accessing credit and vice versa. Results show that borrowers with low networth are likely to be credit constrained while those with high networth have higher chances of accessing credit. Although collateral is negatively correlated with access to credit, it can be inferred from the lack of significance that lenders use collateral only as a secondary source of loan repayment in the event of borrower default.

Table 5
REGRESSION COEFFICIENTS[a]

Variable	Coefficient	Standard Error	T-ratio	P-Value
Constant	-	0.187	4.719	0.000***
HI	0.206	0.041	3.713	0.000***
CS	0.137	0.097	2.496	0.013**
FN	0.143	0.042	2.521	0.012**
Collateral	-0.029	0.034	-0.534	0.594
R^2	13.7	DW	1.796	
Adj R^2	12.7	F-Stat	14.173***	

; *; denote level of significance at 5% and 1% respectively.

Discussion of Results

The paper analysed the factors that determine access to credit by smallholder farmers. From the hypothesised linear regression model for access to credit by smallholder farmers in South Africa, this paper finds household income, capital structure and family networth to positively influence access to credit by smallholder farmers.

The capital structure of the farm enterprise is observed to play a positive and significant role in a farmer's probability to access credit (14%). This observation corroborates with Horton (1957) who opines that "*an increase in indebtedness is most likely to occur on farms with a substantial cushion of owner equity, that is, farms with low financial leverage*". Lenders are inclined to extend credit to borrowers with low gearing. On the other hand, if a farm has a small equity cushion, or if asset and income deflation are unusually severe, an increase in loan default and hence foreclosures will transform creditor interests into owner equities.

It is not surprising that household income was found to contribute the highest to the lender's decision to extend credit to the farmer (21%). This is a logical conclusion because the borrower's income is the first source of repayment at all times. The higher the level of income, the higher the probability that the borrower will repay the credit obtained, ceteris paribus. Borrowers with low income are unlikely to repay the debt with ease. These results confirm those of Kashuliza & Kydd (1996), who found total farm income to be one of the important factors that

influence access to credit. A further observation of this paper is that family networth makes a positive contribution to a farmer's access to debt (14%).

The negative and statistically insignificant coefficient for collateral (-0.534) shows that collateral does not influence access to credit by smallholder farmers in South Africa. As in Chisasa (2015), this paper argues that land held by smallholder farmers in South Africa cannot be used as collateral for acquiring mortgages due to lack of title. A similar observation was made Njeru et al., (2016) for the case of Mwea irrigation scheme in Kenya. Accordingly, although smallholder farmers have land, they do not hold title to the land thus making it impossible to use it as collateral required to access credit (Mpuga, 2010). This result is in line with that of Olatinwo et al. (2012) who identified lack of collateral security as a major problem faced by Nigerian farmers in accessing loans. This finding also corroborates with Kalinda et al. (1998) who opine that when making a lending decision, lenders are particularly concerned about limited or no collateral among other factors.

CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to determine factors that influence access to credit by smallholder farmers in South Africa using survey data collected from Mpumalanga and North West provinces during 2013. Descriptive, correlation and regression analyses were conducted to gain an understanding of the relationship between credit access and its predictor variables. The estimated regression model reveals that the focal variable, capital structure, household income and family net worth are statistically significant decision variables influencing the probability of accessing credit by smallholder farmers in the Mpumalanga and North West provinces of South Africa. However, collateral was found to negatively affect the chances of obtaining credit approval by lenders. This leaves farmers with limited chances of access to collaterised credit. To circumvent this problem, smallholder farmers may have to seek government guarantees in support of their credit applications. The study concludes that an increase in equity capital, which reduces the farmer's leverage, will increase the chances of accessing credit from both formal and informal lenders.

In light of the undisputed importance of the smallholder farmers in employment creation, income generation and contribution to gross domestic product, the study recommends an increase in the number of nonbank credit institutions. The speedy resolution of land tenure will also enable smallholder farmers to provide the collateral required by banks.

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