

IDENTIFYING FACTORS THAT INFLUENCE SMALL-SCALE FARMERS' ACCESS TO CREDIT FROM COMMERCIAL BANKS IN GREATER TAUNG MUNICIPALITY, NORTH WEST PROVINCE, SOUTH AFRICA*

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Abstract. The purpose of this study was to identify factors that influence access to formal bank credit by small-scale farmers in the Greater Taung Municipality area. Understanding factors that determine access to formal credit should help improve productivity, food security and contribute to GDP (Gross Domestic Production). A structured questionnaire was used to sample 110 farmers from a total of 280 using a simple random approach. SPSS and Logistic regression were employed to analyse data. The findings revealed that, as the odds of credit need increases by one unit, access to formal credit increases more than 4 times and a similar explanation pertains to land ownership. Also, the perception towards risks, distance between lender and borrower, loan repayment and access to extension advice increase by 1 unit while there were progressive decreases in the odds for the actual need to access credit. All factors except land ownership was found to contribute significantly to access to credit in the study area. There is a need to establish loans offices closer to farms and operated by officers who understand farmers' challenges within the area in order to simplify lending procedures and improve their perception towards formal credit.

Keywords: determinants, access to formal credit, logistic regression, Taung, odds ratios, small-scale farmers

INTRODUCTION

Worldwide, agriculture is considered a critical sector as well as a development tool in accomplishing the first Millennium Development Goal (MDG) which is to reduce the proportion of people suffering from extreme poverty and hunger by fifty percent by 2015 (World Bank, 2014). In Africa, the agricultural sector provides an opportunity to stimulate growth in other sectors of the economy (mining, manufacturing and services), improves the overall food security, and ultimately reduces poverty. It is argued that small farmers in South Africa, who constitute approximately 80% of the total farming population, contribute less than 20% to the total agricultural output and are constrained by access to formal credit. This is the case even though access to formal credit is not the sole reason behind low productivity levels and inefficiencies associated with small-scale farming in South Africa. There are also several factors linked to the structure of the South African economy, globalization of world economies, political uncertainty and policy uncertainty with trading partners that have resulted in the declining trend in agricultural production. The current condition of small-scale agriculture is

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characteristic not only of South Africa but of all regions across sub-Saharan Africa. Therefore, scaling up agricultural output in the continent requires consistent supply of technological innovations (machinery and IT) as well as the necessary agricultural inputs (including seed, fertilizers, and pesticides), effective knowledge dissemination, and marketing strategies for farm produce based on a comprehensive input-to-output value chain approach. Forward and backward linkages through input and output markets depend on a relatively stable demand for inputs and supplies, on a reliable supply of marketable produce as well as on a consistent demand for produce (Olagunju and Ajiboye, 2010).

According to a report compiled by the South African Department of Agriculture, Forestry and Fisheries (DAFF, 2012), the country's agricultural sector compared to those of other sub-Saharan African countries comprises of two main categories of farmers: subsistence farmers, mainly in former homelands (Africans), and commercial farmers (European) in the formal agricultural sector. The relevant characteristics are provided in the South Africa Yearbook 2011/12 (DAFF, 2012) which also discusses the importance of small-scale farming for the development of agricultural policies in South Africa. The report states that "South Africa's dual agricultural economy comprises of a well-developed commercial sector dominated by Europeans and a predominantly subsistence-oriented sector in rural areas dominated by Africans." Abdalla and Ebiadalla (2012) argue that the main challenge for the South Africa's small-scale agricultural policy development is the creation of an enabling environment conducive for the motivation of smallholder farmers to progress from subsistence systems of production to commercial systems of production: a process referred to as smallholder empowerment. Furthermore, Kirsten and Van Zyl (1998) also argue that while almost 25% of European (white) farmers in South Africa are regarded as large-scale commercial farmers, this is a misrepresentation of the facts because these farms cover a land area smaller than 200 ha, with nearly 5% of them having less than 10 ha. These authors further opine that in South Africa, "small-scale" is a term associated with backward, non-productive, non-commercial, subsistence, inefficient agriculture and is a general description of African farmers, as if they lacked the capacity to become large-scale commercial farmers. In South Africa, the institutional framework put in place to support rural agriculture (small farmers)

has poor support mechanisms to scale up the farmers' productivity. The poor support mechanisms result from other factors, such as policy structures, lack of resources and/or poor implementation of the existing institutional framework aimed at supporting small-scale farmers through marketing and financing. Chauke and Anim (2013) state that the lack (and improper adaptation) of an efficient financial institutional framework to support small rural farmers could lead to inefficiencies and operational failure of small farming.

Accessing finance for small-scale agricultural investments in sub-Saharan Africa is a serious challenge given the fact that these farmers have limited or no assets to be used as collaterals by formal financial institutions when applying for a loan. Agricultural credit is crucial for the acquisition of modern agricultural equipment, development of modern infrastructure as well as adoption of new technologies in Africa. In their study, Karanja et al. (2014) found that some small farmers who have limited access to credit from time to time, use it as a temporary substitute for personal savings in order to access inputs and technology, and to stimulate agricultural production, asset formation and food security as well as a main source of income. Komicha and Öhlmer (2007) opine that credit constraints affect not only the purchasing power of small farmers who intend to procure farm inputs and reduce operating costs in the short run, but also their capacity to make long-run farming investments. Also, it hinders the adoption of risk mitigation technologies. On that basis, the World Bank, through its private financing arm, the International Finance Corporation (IFC), has been sensitizing farmers on the importance of agricultural credit and has emphasized the significant role of credit accessibility to small farmers which enables the manufacturing of marketable products that would contribute towards the overall economic development and growth of host states (World Bank, 2014). Several studies (Abdalla and Ebiadalla, 2012; Dube et al., 2015; Freeman et al., 1998; Inganga et al., 2014; Odendo et al., 2002) in Southern Africa have cited inadequate access to formal credit by small farmers as one of the major constraints that limit input use, affect productivity gains, increase rural poverty and reduce the agricultural sector's contribution to the national economies of sub-Saharan African states. Furthermore, developing countries, with emerging national economies (BRICS), such as India and Brazil, prioritize small-scale agricultural financing as the key to unlock agricultural potential.

In South Africa, after the collapse of the apartheid government in 1994, the government focused its attention on financing emerging farmers who were mostly located in the outskirts of urban towns and cities, to the detriment of small-scale subsistence farmers who are widespread in deep rural areas across the country. The government achieved this objective through the establishment of parastatal organizations such as the Ithala Development Finance Corporation in KwaZulu-Natal Province, the Agricultural Development Banks of Ciskei and Transkei, Agribank of the North West Province, Gazankulu Development Finance Corporation and Lebowa Development Finance Corporation, both in Limpopo Province, and Uvimba Finance Corporation in the Eastern Cape, which provide emerging commercial farmers with cheaper credit compared to mainstream formal institutions such as commercial banks. However, due to low repayment rates of loans offered to emerging farmers and the declining subsidization from government, these institutions collapsed or merged with other organizations (Chauke and Anim, 2013). Consequently, access to credit by emerging farmers is now a serious challenge, thereby further compounding the situation of small farmers who now compete for the limited available finance options available to farmers (Ortman and King, 2010). Dube et al. (2015) argue that there are some critical factors that reduce the small farmers' ability to access formal credit. The purpose of this paper is to identify the contextual factors in Taung Municipal area that affect access to formal credit by small farmers. The logistic regression model is used in the study to analyze the identified factors. It is hypothesized that some factors exist that significantly affect the small farmers' access to formal credit in Taung Municipality.

RESEARCH METHODOLOGY

From an ontological viewpoint, the underlying research philosophy adopted in this paper stems from the objectivist perspective of what constitutes reality. The epistemological approach adopted subsequently is positivism, suggesting that the design will be quantitative in nature. Accordingly, a structured questionnaire was designed and used to collect cross-sectional data from small farmers.

Afterwards, a logistic regression analysis was performed. The use of logistic regression is appropriate when there are one or more explanatory variables which

may be categorical or quantitative in nature to predict a categorical or binary outcome (dependent variable). The purpose of this model was to identify factors affecting the small farmers' access to formal credit without explaining the internal workings of institutions offering formal credit to small farmers. The questionnaire was pre-tested with 15 small local farmers, and the cross-sectional data obtained was compared with information from extension officers serving within the Taung Municipality. The use of cross-sectional data is limited by its disregard for the time factor, and therefore, momentary relationships are used. However, in a study of this nature, which relies on cross-sectional data, parameter estimates were obtained that determined the inherent nature of formal access to credit by small farmers in the area as depicted in Table 7.

The data was then statistically analyzed, and the results were used to draw conclusions based on the research questions. Since all science is theory-based, one way or the other, a literature review was performed in order to provide a suitable and appropriate definition of the small farmer within the context of South Africa, and to provide a theoretical base for the study. The study was conducted in the Greater Taung Local Municipality, situated in the western part of the North West Province of South Africa and located in Dr Ruth Segomotsi Mompati District. The Municipality covers an area of 5,639 sq. km, and accounts for 11.8% of the total area under the District Municipality. The main rural towns/townships in the municipal area are Reivilo, Pudimoe and Taung Central. About 95% of the municipal area is predominantly rural. There are about 106 widely-scattered villages in the municipal area. The agricultural sector, including both commercial and subsistence farms, is the major employer and contributor to the municipal economy. The dominant agricultural enterprises in the area are poultry and livestock farms at commercial and subsistence production levels, with a share of 41.9% and 38.2%, respectively (as at 2014).

There were 280 small farmers in the Greater Taung Local Municipality (READ, 2015). Purposive and proportional simple random sampling technique was used to select 110 farmers covered by this study. Data was collected through interviews using a structured questionnaire. The aim of the purposive sampling technique is to indicate the variables identified during the pre-testing of the questionnaire which farmers perceive as strongly impacting their ability to access credit. The proportional

sampling technique followed the purposive technique to ensure adequate representation of both male and female farmers. Enumerator training was delivered to extension officers from the district department of agriculture so they could administer and pre-test twenty five questionnaires to ensure validity of data.

DATA ANALYSIS

The data was captured into an SPSS spreadsheet and analyzed using the binary logistic regression modeling technique. The main aim of the analysis was to determine the factors that affect the small farmers' access to formal credit in the Greater Taung Municipality. The binary logistic technique has been used in many studies in the field of social sciences where prediction of the presence (or absence) of an outcome is based on values of a set of predictor variables. According to Wooldridge (2012), a coefficient can be used to estimate the odds ratios for each of the independent variables included in this model. In the study, it is asserted that the model shows the relationship between a set of predictor (explanatory) variables (X 's) and a dichotomous response variable $Y(\ln(Pi/1 - Pi))$. The dichotomous response variable Y may equal 0 or 1. $Y = 1$ denotes the occurrence of the event of interest while $Y = 0$ denotes the opposite. The dummy variables, also known as indicators or bound variables, characterize the dichotomous responses. In this study, since only two options were available (namely, "access to formal credit" or "no access to formal credit"), a binary model was set up to define $Y = 1$ for a situation where the small 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 (2012) can be considered as follows:

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

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

$$\log \left[\frac{\theta x}{1 - \theta x} \right] = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \beta_k X_{ki} + \mu_i \quad (3)$$

Thus, the estimation may be based on a linear model for which the following definitions apply:

- θ = logit transformation of the odds ratio;
- α = the intercept term of the model;

β = the regression coefficient or slope of the individual predictor (or explanatory) variables modeled; and

X_i = the explanatory or predictor variables.

During the SPSS analysis, Equation (3) was used to determine the odd ratios using the maximum likelihood procedure. The logistic regression in this study can be specified by Equation (4) below:

$$Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 \dots + \mu_i \quad (4)$$

When analyzing the hypothesis of the study, access to formal credit was considered in relation to eight socio-economic explanatory variables as follows:

Y_i = Access to formal credit (1 and 0 otherwise);

α = Constant and intercept of the equation;

X_1 = Need for formal credit (1 = had a need and 0 = otherwise);

X_2 = Perception of risks (1 = do not fear risks and 0 = otherwise);

X_3 = Distance between the lender and borrower (1 if ≥ 50 km and 0 if ≤ 15 km);

X_4 = Farmers' perception of loan repayment (1 = perceive it as a constraint and 0 = otherwise);

X_5 = Access to formal credit information (1 = have access and 0 = otherwise);

X_6 = Access to extension advice (1 = yes, 0 = otherwise);

X_7 = Total income from farming per year (ZAR);

X_8 = Land ownership (1 = own land and 0 = otherwise); and

μ_i = Correction error term.

Furthermore, correlation coefficients were computed to measure the internal consistency of the individual explanatory variables, i.e. to check whether they correlate with one another. A coefficient of 0.50 and above is an indication of a strong correlation. The results revealed a correlation range between 0.57 and 0.78 among the explanatory variables. Variables that showed no correlations with their peers were removed from the dataset.

RESULTS AND DISCUSSION

The analysis revealed that of the 110 sampled small farmers, 30 did have access to formal credit while others did not. The analysis further revealed that the overall age of small farmers in the study area ranged from a minimum of 22 years to a maximum of 67, with an overall

average age of 44.9 years. On average, farmers with access to credit were found to be younger than those without access to formal credit. The average age of farmers with and without access to formal credit was found to be 32 and 47, respectively. However, this finding was found not to be consistent with a study by Dube et al. (2015) which concluded that older smallholder tobacco farmers in Zimbabwe had higher access to formal credit than younger ones.

On the other hand, Olagunju and Ajiboye (2010) and Abdalla and Ebaidalla (2012) in their respective studies in Northern African countries, argued that access to credit is negatively correlated to age because younger farmers were more educated and had more access to recent and relevant financial information than older farmers who relied mostly on experience. Also, a study by Chauke and Anim (2013) conducted in Limpopo Province concurs with the findings of this research, especially as it was conducted in South Africa. The government and institutions in South Africa enabled access to formal credit for small-scale black farmers only after 1994. Today, the younger generation (Black) of South Africans have access to better education and technology than the older generation who were provided with inferior education levels (Bantu education) compared to their white compatriots.

Small farmers were analyzed by age, as shown in Table 1. Accordingly, in the area covered by this study,

Table 1. Access to credit by small-scale farmers according to age

Tabela 1. Dostępność kredytu dla właścicieli małych gospodarstw rolnych według wieku

Age – Wiek	Farmers with access to formal credit Rolnicy mający dostęp do kredytu na zasadach formalnych	Farmers with no access to formal credit Rolnicy bez dostępu do kredytu na zasadach formalnych
Minimum (years) Wiek minimalny (lata)	22	37
Maximum (years) Wiek maksymalny (lata)	55	71
Average (years) Średnia (lata)	32	47

Source: field survey, 2015.

Źródło: badanie w terenie, 2015 r.

85.7% of the sampled population were females whereas only 14.3% were males. This implies that small-scale farming in the Greater Taung Municipality is dominated by women.

This finding contradicts a study by Chauke and Anim (2013) who found that small-scale farming in Limpopo Province, South Africa was a male-dominated practice. Respondents in the study area indicated that Taung is a dry area; agricultural productivity and revenues are seasonal and not guaranteed. Therefore, most household heads (men) migrate to the surrounding areas of the Northern Cape and North West provinces to seek employment in the mines. Women are left to look after the children and assets, and thus engage in small-scale farming as a means to supplement remittances from their husbands.

However, further analysis as presented in Table 2 reveals that despite the higher proportion of female participants involved in small-scale agriculture in the study area, the number of female farmers who had access to formal credit was lower compared to their male counterparts.

The explanation advanced is that women, generally, are less risk-taking than men. In the event of defaulting in payment, women may not have any alternative sources of income to repay the loan compared to the local male population who may seek employment away from home to generate income to repay the loan. This finding is consistent with that of Karanja et al. (2014) and Inganga et al. (2014). These authors found that females have less access to credit compared to their male counterparts involved in small-scale farming in North African countries. They claim this could be attributed to cultural beliefs which do not allow females to have access to formal credit.

A further analysis of access to extension services and its relationship to credit accessibility was performed. According to the results, as presented in Table 3, 40% of respondents had contact with an extension officer while 60% did not. The rate of extension services per farmer was measured as the number of days per year a farmer was visited by an extension officer. The results revealed that farmers with access to formal credit had an average of 5.16 days per year compared to only 2.34 days per year in the case of farmers without access to formal credit. In other words, farmers with access to formal credit had more extension contact days than those with no access to credit. This finding is consistent with

Table 2. Access to credit by small-scale farmers according to gender

Tabela 2. Dostępność kredytu dla właścicieli małych gospodarstw rolnych według płci

Gender Status	Farmers with access to formal credit (N = 30) Rolnicy mający dostęp do kredytu na zasadach formalnych (N = 30)		Farmers with no access to formal credit (N = 80) Rolnicy bez dostępu do kredytu na zasadach formalnych (N = 80)		Total (N = 110) Razem (N = 110)	
	N	%	N	%	N	%
Female Kobiety	21	70	66	82.5	87	79.1
Males Mężczyźni	9	30	14	17.5	23	20.9

Source: field survey, 2015.

Źródło: badanie w terenie, 2015 r.

that of Dube et al. (2015) who found a positive correlation between the frequency of extension contact and access to formal credit by smallholder tobacco farmers in Zimbabwe.

This finding affirms the role of extension officers in the dissemination of information to local farmers, especially in rural areas where access to information is constrained by poor infrastructure. In the Taung area, extension services are generally provided by government extension officers who focus more on small-scale projects funded through government grants or subsidies. On the other hand, they neglect small farmers not covered by government-funded schemes which are too small to pay the services of private extension officers.

As regards education levels, 41.81% of the sampled small farmers do not have any form of formal education, 33.63% had primary education while 24.54% completed some form of higher education (Table 4). The analysis revealed that small farmers with access to credit had either primary (20%) or higher (80%) education, while the majority of farmers with no access to formal credit were uneducated. This finding is consistent with other studies (Chauke and Amin, 2013; Dube et al., 2015; Kiplimo et al, 2015; Olagunju and Ajiboye, 2010) which highlighted a very strong correlation between credit and education levels, especially in small-scale farming across Africa. This is largely due to the fact that the educated population has better access to information compared to less educated small farmers.

Table 3. Access to credit by small-scale farmers according to contact with extension workers

Tabela 3. Dostępność kredytu dla właścicieli małych gospodarstw rolnych zależnie od kontaktu z przedstawicielami agencji ds. upowszechniania wiedzy

Extension contact Kontakt z przedstawicielem	Farmers with access to formal credit (N = 30) Rolnicy mający dostęp do kredytu na zasadach formalnych (N = 30)		Farmers with no access to formal credit (N = 80) Rolnicy bez dostępu do kredytu na zasadach formalnych (N = 80)		Total (N = 110) Razem (N = 110)	
	N	%	N	%	N	%
Access Dostęp	29	97	15	18.75	44	40
No access Brak dostępu	1	3	65	81.25	66	60

Source: field survey, 2015.

Źródło: badanie w terenie, 2015 r.

Table 4. Access to credit by small-scale farmers according to level of education

Tabela 4. Dostępność kredytu dla właścicieli małych gospodarstw rolnych według poziomu wykształcenia

Level of education poziom wykształcenia	Farmers with access to formal credit (N = 30)		Farmers with no access to formal credit (N = 80)		Total (N = 110) Razem (N = 110)	
	Rolnicy mający dostęp do kredytu na zasadach formalnych (N = 30)		Rolnicy bez dostępu do kredytu na zasadach formalnych (N = 80)		N	%
	N	%	N	%	N	%
No education Brak wykształcenia	0	0	46	57.50	46	41.81
Basic education Wykształcenie podstawowe	6	20	31	38.75	37	33.63
Higher education Wykształcenie wyższe	24	80	3	3.75	27	24.54

Source: field survey, 2015.

Źródło: badanie w terenie, 2015 r.

Most small farmers in the Greater Taung Municipality practice mixed farming (crop and livestock production activities), with 97.4% of the sampled respondents being engaged in livestock farming. Livestock is mostly used as the source of food for households or is sold to generate income for the purchase of basic inputs or to supplement off-farm income. Some respondents indicated that livestock, such as donkeys, are used as a mean of transport. The donkeys are used to pull trailers of farming inputs to barns or to the main road for public transportation to auction floors.

The mean number of livestock units among the sampled households was 4.1. As indicated in Table 5, farmers with access to formal credit had relatively more livestock units than those with no access to formal credit.

The perception of formal credit risk by small farmers was also addressed in the study. According to the analysis, about 71.1% of the total population sampled declared not to be willing to take the risk of borrowing from formal financial institutions (Table 6). In turn, 28.9% were ready to take such risks.

Table 5. Access to credit by small-scale farmers according to farming enterprise

Tabela 5. Dostępność kredytu dla właścicieli małych gospodarstw rolnych w podziale na rodzaj prowadzonej hodowli

Farming enterprise	Farmers with access to formal credit (N = 30)		Farmers with no access to formal credit (N = 80)		Total (N = 110) Razem (N = 110)	
	Rolnicy mający dostęp do kredytu na zasadach formalnych (N = 30)		Rolnicy bez dostępu do kredytu na zasadach formalnych (N = 80)		N	%
	N	%	N	%	N	%
Poultry – Drób	10	33.33	36	45.00	46	41.81
Sheep – Owce	6	20.00	26	32.50	32	29.09
Goat – Kozy	0	0.00	12	15.00	12	10.90
Cattle – Bydło	14	46.66	6	7.50	20	18.18

Source: field survey, 2015.

Źródło: badanie w terenie, 2015 r.

Table 6. Perception towards credit risk by small-scale farmers

Tabela 6. Percepcja ryzyka przez właścicieli małych gospodarstw rolnych

Attitude towards risk Postawa wobec ryzyka	Farmers with access to formal credit (N = 30) Rolnicy mający dostęp do kredytu na zasadach formalnych (N = 30)		Farmers with no access to formal credit (N = 80) Rolnicy bez dostępu do kredytu na zasadach formalnych (N = 80)		Female farmers (N = 94) Kobiety prowadzące działalność rolniczą (N = 94)		Male farmers (N = 16) Mężczyźni prowadzący działalność rolniczą (N = 16)		Total (N = 110) Razem (N = 110)	
	N	%	N	%	N	%	N	%	N	%
	Risky Podejmowanie ryzyka	23	76.66	56	70.00	82	87.23	3	18.75	79
Not risky Niepodejmowanie ryzyka	7	23.33	24	30.00	12	12.76	13	81.25	31	28.18

Source: field survey, 2015.

Źródło: badanie w terenie, 2015 r.

The reasons why small farmers are not interested in credit are: lack of collateral securities; high interest rates; and frequent droughts in the study area. Disaggregating the 28.9% of farmers in the area who venture into formal credit, 76.6% indicated that it was risky to borrow from formal financial sources. Meanwhile, 70% of farmers with no access to formal credit indicated that borrowing from formal financial sources involved risks in terms of repayment default, hence they were scared of borrowing.

Focusing on the 85.7% of female respondents within the study area, the analysis showed that 87% of them perceived borrowing from financial institutions to be risky, unlike the other 12.76%, as shown in Table 6. The Table also shows that there are 91% of female-headed households, compared to only 29% of the male-headed households, who perceive borrowing as risky. The result confirms the fact that the majority of female-headed households fear the risk of repayment, while the majority of male-headed households have a different view. This difference in views may be one of the factors resulting in the lower participation of women in the formal credit market. This finding is consistent with that of Chauke and Anim (2013); Dube et al. (2015) who conducted similar studies in different parts of South Africa and discovered a difference in risk perception across genders in the small farmers population, with female farmers being more risk averse compared to their male counterparts.

A regression analysis using logistic regression was performed, and the results are presented in Table 7. According to the analysis, credit needs, access to formal credit information and extension contact all had positive betas and were significant as influential factors for the access to formal credit by small farmers in the Taung Municipality.

This suggests that as the number of small farmers in the Taung area keeping contact with extension officers increases, so does the extent of information on the benefits of formal credit to farmers. In turn, as the negative perception of formal credit decreases, access to formal credit does the opposite. On the other hand, variables with negative signs are as follows: the need for formal credit; perception of risks; distance between the lender and borrower; farmers' perception of loan repayment; and total income from farming per year (whereas a positive sign was associated with access to extension advice). These results imply that access to credit decreases with an increase in these factors. The signs of most of these determinants are consistent with the findings from similar studies by (Abdalla and Ebiadalla, 2012; Chauke and Anim, 2013; Dube et al., 2015). However, in another study conducted by Komicha and Öhlmer (2007), positive relationships were found between land ownership and access to formal credit. This was attributed to collateral assets required by formal institutions when

Table 7. Results of Logistic Analysis on access to formal credit by small-scale farmers

Tabela 7. Wyniki logistycznej analizy dostępności kredytu udzielanego na zasadach formalnych dla właścicieli małych gospodarstw rolnych

Explanatory variables Zmienne objaśniające	β	Standard Error Błąd standardowy	Wald statistics Statystyka Walda	Exp (β)	<i>p</i> -value Wartość <i>p</i>	Significant test Test istotności
Constant – Stała	8.25	4.89	13.92			
X_1 Credit need – Potrzeba kredytowa	1.49	0.84	3.98	4.437	0.046	**
X_2 Formal credit – Kredyt udzielany na zasadach formalnych	-1.90	0.68	3.10	6.685	0.078	*
X_3 Risk perception – Percepcja ryzyka	-2.67	0.88	3.41	14.439	0.065	*
X_4 Dist. lend/bo – Odległość pomiędzy kredytobiorcą a kredytodawcą	-1.37	0.58	15.48	3.935	0.000	***
X_5 Credit information – Informacje o kredycie	1.65	0.64	15.79	5.206	0.000	***
X_6 Repay't percept – Obawy dotyczące spłaty	-5.75	0.78	37.33	314.190	0.035	**
X_7 Ext services – Usługi upowszechniania wiedzy	1.46	0.73	4.42	4.305	0.000	***
X_8 Income/yr – Roczny dochód	-1.44	1.20	2.61	4.220	0.106	ns
Statistics – Statystyki						
No. of observations – Liczba obserwacji	280					
Prob > F – Prawdopodobieństwo > F	0.000					
R – squared – Współczynnik R ²	0.773					
Adj. R-squared – Skorygowany współczynnik R ²	0.742					

****p* < 0.01; ***p* < 0.05; **p* < 0.10; ns – not significant; N = 110.

Source: field survey, 2015.

****p* < 0,01; ***p* < 0,05; **p* < 0,10; ns – nieistotne; N = 110.

Źródło: badanie w terenie, 2015 r.

examining the credit applications. This finding does not contradict the one obtained in the Taung area on the grounds that small farmers in the study area use communal land, and therefore they have no title deed. Hence, such land cannot be considered as asset and, thus, cannot be used as a collateral to obtain credit from formal financial institutions.

As indicated by the Exp (β) values, a value less than 1 would indicate the opposite. Thus, as the odds of a credit need increase by one unit, those of access to formal credit increase by more than 4 times. The same is true for formal income from farming per year and land ownership: in these cases, the actual need for formal

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 those of Chauke and Anim (2013) who concluded that extension services play a crucial role in empowering smallholder farmers with farming techniques, knowledge and management skills.

Furthermore, extension services provide essential information to farmers regarding agricultural interventions such as financial support, production and marketing. Dube et al. (2015) found that access to formal credit by smallholder farmers in Zimbabwe was significantly

influenced by access to extension support services. While the logistic results of this study depict a decreasing need for accessing credit with a unitary increase of the remaining predictor variables, a study by Inganga et al. (2014) in Kenya confirmed that the repayment period was a critical determinant of access to formal credit.

Although risks and uncertainties are common across all sectors of every economy, they are much more conspicuous in farming than in most non-farming sectors. Dube et al. (2015) outline that among others, the type and severity of risks faced by farmers vary from one enterprise to another, depending on their geographic location, economic conditions and prevailing government policies (Kiplimo et al., 2015). Karanja et al. (2014) further affirm that transaction costs such as distance from the operations negatively affect small farmers, making it harder for them to access formal credit and making them resort to informal sources of funds. The results of the analysis of the total assets value contradict those of a study conducted by Freeman et al. (1998) who found that the value of farm assets owned is among the significant variables that explain the participation of smallholder farmers in formal credit markets. Meanwhile, Wooldridge (2002) argues that the farmers' experience is a critical factor in adopting modern technologies and accumulation of assets. The finding that increased asset accumulation results in decreased dependence on credit is understandable and reflective of realities. Contrary to this finding, a study by Dube et al. (2015) associated increased credit needs with increased income generation.

SUMMARY AND CONCLUSIONS

The objective of this paper was to identify and regress factors that inhibit access to credit by small farmers in the Greater Taung Municipality of the North West Province, South Africa. Purposive and proportional simple random sampling technique was used to select respondents in the study area. The mixed research methods involving both qualitative and quantitative approaches were used in the study. The aim was to eliminate the negative aspects of each approach. The Statistical Package for the Social Sciences, version 23, was used to analyze the data and the results presented in tables. Logistic regression was employed to estimate the effects of individual variables on access to credit by small farmers. The results showed that as the odds of all factors contributing towards access to credit, except risk perception,

increased by one unit, access to formal credit increased by more than 4 times. However, the need for credit and total income from credit had a negative influence on access to formal credit by small farmers in the study area.

RECOMMENDATIONS

Since farmers were found to be risk-averse and dependent on own farming incomes, there is a need for increased extension contact and effective training programs that would include access to insurance and use of modern technologies such as cell phones to close the gap between the lender and the borrower. Due to the negative correlation between distance and access to formal credit in the study area, there is a need to establish loans offices close to farmers operated by bank officials who can relate with farmers in order to reduce lending procedures, risks and educate them on their perceptions of loan repayment. The establishment of a government-subsidized agricultural bank which provides credit to farmers at lower interest rates and offers flexible repayment terms is also recommended.

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CZYNNIKI WPŁYWAJĄCE NA DOSTĘPNOŚĆ KREDYTU UDZIELANEGO PRZEZ BANKI KOMERCYJNE MAŁYM GOSPODARSTWOM ROLNYM Z GMINY GREATER TAUNG W PROWINCJI PÓŁNOCNO-ZACHODNIEJ (RPA)

Streszczenie. Celem artykułu jest zidentyfikowanie czynników wpływających na dostęp właścicieli małych gospodarstw rolnych z gminy Greater Taung do kredytu udzielanego przez banki komercyjne. Znajomość warunków udzielania kredytu na zasadach formalnych powinna przyczynić się do zwiększenia produktywności, poprawy bezpieczeństwa żywnościowego, a ponadto przeloży się na wzrost PKB. Dane zostały zebrane za pomocą ustrukturyzowanego kwestionariusza. Przy zastosowaniu prostej metody wyboru losowego z grupy 280 rolników wytypowano 110 respondentów. Do analizy danych użyto oprogramowania SPSS i metod regresji logistycznej. Na podstawie wyników ustalono, że wraz ze wzrostem potrzeb kredytowych o jedną jednostkę dostępność kredytu udzielanego na zasadach formalnych wzrasta ponad czterokrotnie, przy czym analogiczna zależność dotyczy własności gruntów. Ponadto wzrostowi o jedną jednostkę zmiennych określających percepcję ryzyka, odległości pomiędzy kredytodawcą a kredytobiorcą, obawom o spłatę kredytu i dostępowi do usług upowszechniania wiedzy towarzyszy stopniowe obniżanie szans na wystąpienie faktycznej potrzeby dostępu do kredytu. Uznano, że w obszarze poddanym badaniu wszystkie czynniki z wyjątkiem własności gruntów znacznie przyczyniają się do poprawy dostępu do kredytu. Placówki instytucji kredytowych powinny zatem być lokalizowane bliżej gospodarstw rolnych, a ich prowadzeniem powinni zajmować się urzędnicy, którzy rozumieją wyzwania stojące przed tutejszymi rolnikami. Pozwoli to uprościć procedury kredytowe i poprawić sposób postrzegania kredytu.

Słowa kluczowe: uwarunkowania, dostęp do kredytu na zasadach formalnych, regresja logistyczna, Taung, iloraz szans, małe gospodarstwa rolne

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