“A diagnosis of rural agricultural credit markets in South Africa: empirical evidence from North West and Mpumalanga provinces”

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A diagnosis of rural agricultural credit markets in South Africa: empirical evidence from North West and Mpumalanga provinces

Abstract

Access to credit by smallholder farmers in South Africa still remains a confounding problem. The aim of this paper is to identify the major sources of credit for smallholder farmers. A total of 362 smallholder farmers were surveyed in Mpumalanga and North West provinces. A multi-stage sampling technique was used and the data analyzed using descriptive statistics, Analysis of Variance (ANOVA) and the Ordinary Least Squares multiple regression statistical technique. Results show that commercial banks give larger loans but to fewer smallholder farmers than nonbank lenders. The coefficients for commercial banks were positive and significant. It has also been observed that fewer smallholder farmers demand credit from commercial banks than informal lenders (savings clubs, friends, cooperatives, family, Government) because of high interest rates, long and difficult application procedures, fear of losing collaterized assets and high transaction costs. The study has policy implications in the areas of investment in information gathering, reduction of information asymmetry and an increase in the number and value of loans accessed by smallholder farmers from commercial banks. Further research is therefore, recommended on measures to alleviate credit rationing of smallholder farmers by commercial banks.

Keywords: rural credit markets, agriculture, South Africa.
JEL Classification: G23, N57, O13.

Introduction

In South Africa, it is estimated that the majority of the rural population most of whom rely on agriculture for their livelihood, still has no access to formal credit. Furthermore, unemployment and poverty among rural South Africans have been on the rise. The specific circumstances of smallholder farmers with respect to financial support services are believed to be deteriorating (Chisasa and Makina, 2012). The agricultural sector is a very important sector to the South African economy, contributing about 3% to Gross Domestic Product (GDP). Smallholder farmers have been observed to offer the highest employment prospects mainly to rural South Africans. However, their full potential has not been realized due to lack of access to credit required for the purchase farm inputs and capital equipment. The problem has been exacerbated by inadequate credit distribution channels. Previous studies have indicated a decline of commercial bank branches in rural areas (Moyo and Coetzee, 2002, 2005).

The main reason often cited by banks for not lending to smallholder farmers is high default risk, uncertainty and risk inherent in agricultural production and marketing (Owusu-Antwi and Antwi, 2010, p. 46). Other reasons cited are the high cost of lending to small farmers, lack of collateral, the low rate of interest on agricultural loans, and the long-term nature of agricultural loans which is not compatible with bank lending, particularly in situations of high risk. A negligible number of rural borrowers obtain credit from institutional sources. This paper therefore argues that South Africa's credit institutions are not helping the country accelerate sustainable agricultural growth and poverty reduction. Policies and strategies to improve performance in the rural economy and efficiency in financial institutions still remain a challenge and need to be expedited.

In developing economies, a large share of the population typically depends, for its livelihood on the informal economy. Most of their income comes from subsistence farming or from operating small unincorporated enterprises (Blades, Ferreira and Lugo, 2011, p. S1). Access to financial services has been recognized as an important element of development, and more emphasis is being given to extending financial services to low-income households (Claessens, 2006, p. 234; Hinson, 2011, p. 320). The search for an explanation of an optimal structure of rural financial markets in developing countries has for decades been elusive.

Previous studies (Coetzee, 2002; Moyo and Coetzee, 2002) have reported on rural financial markets and the supply of financial services. While there is consensus that smallholder farmers are credit constrained, none of these studies focused on sources of credit for smallholder farmers using a survey approach. This paper fills that gap. The aim of this paper is to analyze the sources of credit supplied to smallholder farmers in South Africa. The purpose of the analysis is to determine the major suppliers of credit and the patterns of credit supplied thereof. The role of formal rural financial institutions such as Non-Governmental Organizations (NGOs), commercial banks and informal financial intermediaries such as *mashonisas* (microfinance institutions) and *stockvels* (savings clubs) for purposes of sustainable development under conditions of risk and uncertainty is discussed. As the majority of South Africans live and work on the farms, emphasis is

placed on the activities of rural financial institutions in the agricultural sector.

This paper proceeds as follows. Section 1 discusses the literature. Section 2 presents the methodology used in this paper. Section 3 presents the results of the study. The final section summarizes and concludes the study.

1. Literature review

Rural financial markets in developing countries can be categorized into formal and informal sectors (Spio and Groenewald, 1997, p. 121). The formal sector consists of institutions such as banks, credit cooperatives and public sector organizations which act as intermediaries between borrowers and savers or borrowers and government. In the informal sector, private individuals provide credit largely out of their own funds.

1.1. Rural credit market theory. Hoff and Stiglitz (1996) proposed three theories of rural credit markets. The first theory hypotheses that village moneylenders in the informal market are monopolists, charging the highest interest rate possible so as to maximize profits. Secondly, it is hypothesized that the rural credit market is almost perfectly competitive with market clearing equilibrium, where high interest rates indicate high risk of borrowers. The third school of thought, the imperfect information theory, suggests that the informal credit market is characterized by uncertainty, high transaction costs, and information asymmetry, which typically leads to moral hazard and adverse selection.

Rauchhaus (2009, p. 871) observes that whereas moral hazard occurs when an insured party has an opportunity to take hidden action once a contract is in effect, adverse selection is the result of asymmetric information prior to entering into a contract. Failing to distinguish between these two types of principal-agent problems may lead to policy advice that is irrelevant or potentially harmful. To eliminate the adverse effects of asymmetric information, credit providers employ indirect (passive) or direct (active) screening mechanisms to determine the quality (risk level) of borrowers. In the case of indirect screening, the interest rate may play a dual role. First, the interest rate may be used for pricing purposes and secondly as an indirect screening instrument. Indirect screening, therefore, often leads to credit rationing.

1.2. Empirical evidence. Rural credit markets have often times been described as *fragmented* (Conning and Udry, 2005, p. 7). Different segments of borrowers are observed to be systematically sorted across different loan types and lending intermediaries. This distribution is based on the characteristics of the borrowers, the lenders and the activities financed and other variables in the trading environment (McKinnon, 1973, p. 5).

Empirical evidence shows that there is great variability in the interest rate charged by lenders for superficially similar loan transactions within the same economy. In Nepal, Yadav et al. (1992, p. 434) observed that two factors cause segmentation in the rural financial markets. First, regulated interest rates in the formal sector lead to credit rationing that favors farm households with collateral. Borrowers without collateral are excluded and therefore have to resort to the informal credit market. In addition, these loans are characterized by wide interest rate spreads between borrowing and deposit rates in many financial markets in developing economies. Second, the problems of information asymmetry and hence screening, incentive (Hoff and Stiglitz, 1990; and Owusu-Antwi and Antwi, 2010) and enforcement (Besley, 1994) in the rural financial market is less pronounced in the informal than the formal credit market. Thus, given the differential informational structure, the formal sector tends to specialize in the provision of production loans, whereas the informal sector plays the major role in the provision of consumption loans.

Moneylenders and financial intermediaries in the rural economy include most importantly input suppliers, rural product traders (including agro-industry exporting firms), and banks. They often invest heavily in screening and monitoring their clients, and may also intervene to significantly shape their clients' choice of technology and other production decisions.

Another source of credit is contract farming. Marcoul and Veyssiere (2010, p. 1051) showed that contract farming firms typically contract to market or process a farmer's harvest in exchange for credit and often other services like technical assistance and farm input sales. An important characteristic of this form of lending is that the loan contract often involves much less collateral than would a similar bank loan, and at times, no collateral other than a crop pledge. Contract farming firms are also often able to better value some of the items a farmer might provide as collateral. A contract farming firm for instance will be much more willing to accept a farmer's crop as collateral than a bank.

1.3. Government intervention. Rural financial markets have experienced government intervention since the times of Babylon and Mesopotamia (Conning and Udry, 2005, p. 11). Interventions ranged from regulating the operation of credit for farmers and merchants, "including caps that limited interest rates to 33 and one third percent on loans of grain and regulations that limited what could be collected

on agricultural debts in the event of drought or certain other natural disasters" (Goetzmann, 1996). An earlier study by Bhatt (1989, p. 16) revealed that public or government intervention is essential to promote and develop a sound credit system. Bhatt (1989, p. 16) argues further that the public agency that must perform this function is the central bank, which has to act as a leader, promoter, coordinator, and regulator of the entire financial system. However, there are mixed views on the role of government in facilitating access to finance, particularly by the poor. Claessens (2006, p. 207) argues that government interventions to directly broaden access to finance are "costly and fraught with risks, among others the risk of missing the targeted groups".

Swinnen and Gow (1999, p. 34) using evidence from Central and Eastern European Countries (CEECs), see government intervention as necessary. They argue that governments often intervene in agricultural credit markets by providing guarantees to banks for loans, by setting up credit institutions specific to agriculture and by subsidising credit to agricultural producers. Also in CEECs, governments have intervened by providing interest rate subsidies on specific forms of short-term credit and by providing government guarantees for long-term machinery and capital investments to overcome the collateral problem. Contrary to assertions by Swinnen and Gouw (1999), Claessens (2006, p. 207) argues that there are negative effects arising from government intervention in the rural agricultural credit markets.

1.4. The state of retail finance in South Africa's rural areas. The Strauss Commission (1996b) observed that more rural clients have access to savings transmission facilities than to credit facilities. However, the transaction costs per client to use these facilities are quite high. Coetzee (2002, 2005) argued that "the market is not playing its role as we do not see formal commercial bank activities covering all the rural areas and it seems as if the trends are against rural areas". It was also observed that successful private sector small financial retailers tend to concentrate on the urban areas. Rural entrepreneurs have only limited access to formal loan facilities. Chisasa and Makina (2012, p. 779), using secondary data for the period of 1970-2009 demonstrated that the supply of credit to smallholder farmers remained a small proportion of the total domestic private sector credit.

1.4.1. Public sector institutions. The Land Bank was established to service the credit needs of commercial farmers (Machethe, 2005, p. 7). Today it is the only primary development finance institution working in agriculture and rural development following the demise of the Agricultural Credit Board. It therefore has a very important role to play in the supply of financial services to the rural poor. The objectives of the Land Bank flow from the Land Bank Act, and are aligned with government policies and the country's socioeconomic needs. The bank is expected to play a pivotal role in advancing agriculture and rural development.

Moyo and Coetzee (2002, 2005, p. 4) observed the Land Bank to be void of a service structure, operating only 25 branches. To mitigate this challenge, the Land Bank uses agents such as the First National Bank (FNB) and the Postbank to distribute their products. The Land Bank's 25 branches service their biggest income sources, namely individual farmers and cooperatives. It does not extend loans to emerging farmers in their bronze range of products (Moyo and Coetzee, 2002, 2005, p. 4).

While the Land Bank has succeeded in reaching many smallholder farmers with loans, the majority of these farmers still do not have access to credit (Machethe, 2004, p. 7; Chisasa and Makina, 2012, p. 771). Table 1 below shows that only a minute portion of the approved funding was allotted to the retail sector of which the smallholder farming sector is a component. Although no detailed information is available on the distribution of credit by sector, it is evident that credit allotted to smallholder farmers by the Land Bank is negligible. A total of 7 percent was disbursed to the retail sector compared to 86 percent that was disbursed to the corporate sector during the same year. The Land Bank also reported that an emerging farmer support facility was approved by Cabinet and it is still in its pilot phase (Land Bank Annual Report, 2010/11, p. 28).

Table 1. Land bank approved funding and disbursements

Approved funding	(%)	Disbursements	(%)
Retail long term	17	Retail long term	5
Retail medium term	3	Retail medium term	1
Retail short term	4	Retail short term	1
Corporate long term	7	Corporate long term	7
Corporate medium term	6	Corporate medium term	0
Corporate short term	63	Corporate short term	86

Source: Land Bank annual report (2010/11, p. 29).

Coetzee (2000, p. 8) opines that South Africa experienced failures and limited success of provincial financial parastatals with Ithala Development Finance Corporation in KwaZulu Natal being the only successful institution. Except for Ithala, the rest of the parastatals have since failed. The problem with most of the parastatals is that they did not have branches from which they could service their clients and therefore lacked outreach.

The reformed parastatal banks, such as Khula Enterprise Finance Limited, have similar approaches to the enterprise lenders, however, they boast of a far greater existing investment base to build from. Some

parastatal banks have savings as a resource. For example, Ithala has approximately 800 000 clients while others have institutional investors, which provide them with access to cheaper capital.

1.4.2. Private sector institutions. The mushrooming of NGOs in South Africa has come with some relief to the poor. NGOs are an important cog in the rural financial market set-up, providing finance to small and micro enterprises (DGRV SA, 2000, p. 9). In most developing countries, NGOs have filled in the vacuum left by the closure of many specialized credit institutions. However, it is argued that NGOs have failed to fully service the rural market due to lack of subsidies.

A village bank is defined as a savings and credit co-operative (DRVA SA, 2000, p. 10). The first village bank in South Africa was formed in 1994 in the North West province. Since then, the number of village banks in South Africa has increased supported by a considerable demand for collective action formats at the grass roots level. Village banks are organized and owned by members (Coetzee, undated). Their objectives are to provide appropriate financial services at village level, and to link this service with the commercial banking sector. Members save first and obtain credit when the fund has accumulated sufficient savings to extend credit. Survey results showed that the Bhambanana Village Bank which opened in June 2000 had 3 060 members drawn from a 25-50 kilometer radius had deposits amounting to R290 900 held at First National Bank (Jones and Dallimore, 2009, p. 11). Other results were reported as follows (see Table 2 below).

Table 2. Village bank activity in South Africa

Province	Name of village bank	No. of members	Value of deposits (*R*)
North West	Motswedi	1 451	1 800 000
Mpumalanga	Sakaletfu	515	(Not available)
Limpopo	Mbathabatha	279	47 000

Source: Jones and Dallimore (2009, p. 12).

In the 1980s, the Catholic Church led the establishment of the Cape Credit Union League (CCUL), which became the first Savings and Credit Co-operative League (SACCOL) in South Africa (Department of Trade and Industry (DTI, 2012, p. 32). Credit Unions have recorded substantial growth in South Africa. Membership now exceeds 6 000, savings to the extent of just over R10 million contributed by members and a loan book with a balance of R9 million. The development of credit unions has been with minimal donor or Government support. The contribution of credit unions to the development of the "poorest poor" still remains constrained by lack of resources.

Agricultural producer cooperatives serve their members who are commercial farmers. However, a few of these co-operatives assist with smallholder farmer development projects (DGRV SA, 2000, p. 11). According to the DTI (2012, p. 36) report, the agricultural sector, which constitutes 25% of registered co-operatives, is still dominant. Factors contributing to this position include that there is still a strong association of co-operatives within the agricultural sector and, that in most rural economies; the only opportunities available are in this sector. Other sectors such as the services sector (17%) and the multipurpose sector (14%) have emerged strongly, challenging the agricultural sector in the co-operative sector.

Commercial banks play a pivotal role in the delivery of financial services (Mashigo and Schoeman, 2011, p. 149). The four largest banks in South Africa are Standard Bank, ABSA, First National Bank and Nedbank. They hold over 80 percent of the market share. Commercial banks only provide a limited range of services in rural areas, although they have the highest incidence of branches in the rural areas, together with the Post Office (Strauss Commission, 1996). South Africa also has a higher ratio of branches per population than elsewhere in Africa (see Table 3 below). However, this higher incidence of branches is skewed, with rural areas having approximately twice the number of people per branch than urban areas. A sharp decline in rural branches is also evident. It is estimated that whereas in 1995 approximately 50 percent of the South African population had easy access to commercial bank facilities, this number has declined to approximately 30 percent (Moyo and Coetzee, 2002, p. 8).

Table 3. Commercial bank branches per 100 000 adults

Country	2005	2006	2007	2008	2009	2010	2011
Algeria	5	5	5	5	5	5	5
Angola	3	4	5	6	6	9	11
Egypt	4	4	4	4	5	5	*
Ghana	3	4	4	5	5	5	5
Nigeria	4	4	5	6	6	6	6
South Africa	7	7	6	8	9	10	11

Source: World Development Indicators (2013).
Note: * Data not available.

With increased globalization and technological development, commercial banks are expected to reduce their branch network, keeping only those branches that are profitable and hence justify their continued presence. Areas without high net worth demographics, electricity and communication channels will not be part of contemporary banking. According to DGRV SA (2000, p. 13), to all intents and purposes no major expansion of commercial bank activities should be expected in rural areas. One would only expect banks to show more interest in rural areas once technology has been made accessible to rural people. Rural people and smallholder farmers in general, will still save with commercial banks. However, it will become increasingly more expensive to do this as bank branches decrease in number in rural areas. In this regard, Hinson (2011, p. 330) conceptualizes a model (Open Federated Brick and Click Model) of mobile-based banking services for poor people in developing country contexts. Hinson argues that this model could be useful in building pathways for increasing financial access to the poor. To this end, Hinson (2011, p. 330) concludes that effort and resources should be directed towards offering banking services through mobile technologies.

Private sector agricultural firms were started by the Financial Aid Fund of South African Sugar Association to support private sector processors. This initiative was boosted by the cotton ginners and vegetable processors and agents. Farmers are provided with crop establishment capital and in some instances working capital. Some institutions also provide extension services. This method of finance is quite common in contract farming. It has potential for development on a vast scale in the agricultural sector, especially if commercial farmers can be convinced to contract smallholder farmers to ensure throughput and turnover.

2. Data and methodology

The study utilized survey data from Mpumalanga and North West Provinces of South Africa collected between July and November 2012. Multi-stage sampling technique was used. A total of 500 questionnaires were distributed to smallholder farmers from which 362 responses were received and used for the analysis. The research instrument was successfully subjected to reliability and validity tests using confirmatory test and Cronbach alpha.

Multi-stage sampling technique was used in selecting the respondents. In the first stage, two out of nine provinces in South Africa were selected, that is, North West and Mpumalanga provinces. These provinces were selected because of their strategic importance in contributing to South Africa's food reserves, especially with maize production. Maize is the staple food of South Africa. The two provinces rank second and third respectively after the Free State province (DAFF, 2012, p. 9). The Free State province was excluded from the study owing to financial constraints. The second stage involved a simple random selection of municipal districts from each of the two provinces. All three municipal districts in the North West province were surveyed while two of the three district municipalities in Mpumalanga were included in the sample. The third district in Mpumalanga Province was not included in the study due to financial limitations. Thus, Dr. Modiri Molema, Dr. Ruth Mompati Bojanala and Dr. Kenneth Kaunda district municipalities were selected from the North West Province. Gert Sibande and Nkangala District Municipalities were selected from Mpumalanga Province. In the last stage, a total of 500 farmers were selected among the participating districts wherein 100 farmers were randomly selected from each of the five districts with the aid of the African Farmers Association of South Africa listing. This sampling procedure follows that of Oni et al. (2005), Okunade (2007) and Oladeebo and Oladeebo (2008).

Following from the main objective of the study, the null and alternate hypotheses were postulated thus:

H_0: Private banks supply less credit to smallholder farmers than public institutions and informal credit institutions in South Africa.

H_a: Private banks supply more credit to smallholder farmers than public institutions and informal credit institutions in South Africa.

The data was analyzed using SPSS version 22 and was subjected to descriptive statistical analysis including frequencies. Multiple regression was used to test the hypothesis using the Ordinary Least Squares method. Taking aggregate credit supplied to smallholder farmers as the dependent variable and individual sources of credit as the predictors the credit supply model estimated to derive the following equation:

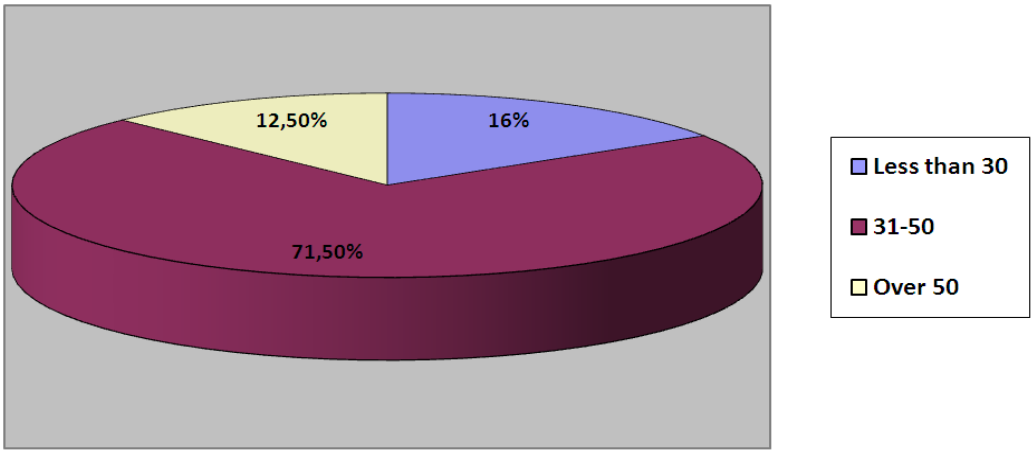
$$C_s = \beta_0 + \beta_1 A + \beta_2 N + \beta_3 S + \beta_4 F + \beta_5 LB + \beta_6 St + \\ + \beta_7 Cp + \beta_8 MI + \beta_9 PF + \beta_{10} G + \beta_{11} O + \varepsilon_t, \quad (1)$$

where C_s is the total amount of credit supplied to smallholder farmers A is ABSA Bank, N is Nedbank, S, Standard Bank F is First National Bank (FNB); LB: Land Bank; St is Stockvels, Cp is Co-operatives; MI is Microfinance Institutions; PF is peer farmers; G is Government; O is Other. β_0, β_{11} are the coefficients explaining the partial elasticities of explanatory variables. These values are constants determined by available technology, ε_t white noise. The results of the study are presented below.

3. Results and discussion

3.1. Socio-demographic profile of respondents. *3.1.1. Age distribution.* The study first analyzed the

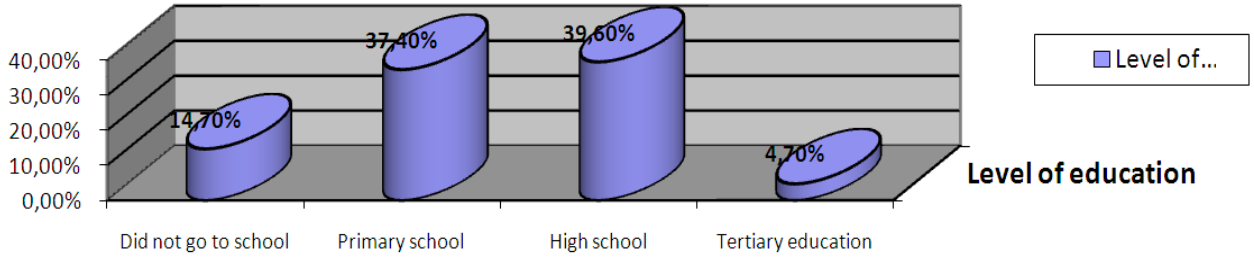
demographic characteristics of the respondents. Respondents were asked to indicate their age. The purpose was to determine the age concentration and establish the patterns of interest in farming as a business. Figure 1 below shows that the majority of the respondents were between 31 and 50 years old (71.5%, n = 362) while only 0.3% (n = 362) was over 50 years old. This shows that the bulk of the respondents are still in their active and productive age group. It is also encouraging to note that some of the respondent farmers (16%, n = 362) are younger than 30 years of age.



Source: Author's calculations based on survey data.

Fig. 1. Age distribution of farmers

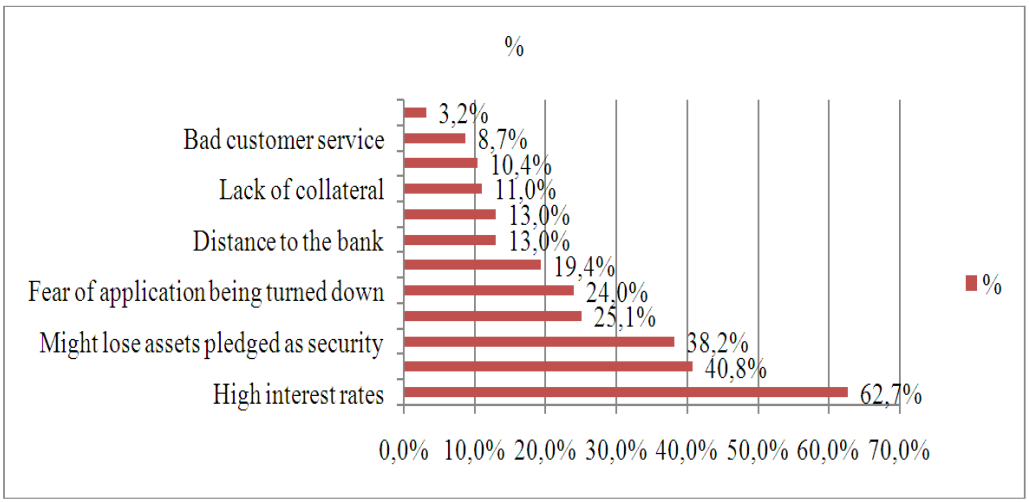
The majority of farmers are married (48.6%, n = 362). This suggests that farming is taken seriously for the purpose of generating income for taking care of the family. What is worrying though is that while 39.6% (n = 362) received high school education, only 4.7% (n = 362) had received tertiary education (Figure 2 below). The majority either did not go to school (14.7%, n = 362) or had received primary school education (37.4%, n = 362). As anticipated, 65.3% (n = 362) of the respondents were male.



Source: Author's calculations based on survey data.

Fig. 2. Level of education

Most of the farmers (72.2%; n = 362) operate on relatively small pieces of land of up to 20 hectares suggesting that farm size could be a constraint in their quest to grow. The respondents were also asked to indicate the factors that limit them from borrowing from banks. The purpose of this question was to determine factors that inhibit farmers from accessing credit and hence limit the availability of factor inputs and growth. High interest rates (62.7%), long and difficult application procedures (40.8%), fear of losing assets pledged as security (38.2%), high transaction costs (25.1%) are among some of the factors limiting smallholder farmers from accessing credit from formal financial institutions. Figure 3 below presents the detailed summary results. On the other hand, farmers indicated the need for inputs such as fertiliser, seed and pesticides, payment of wages for workers and irrigation equipment as key drivers for credit demand.



Source: Author calculations based on survey data.

Fig. 3. Determinants of demand for credit

3.2. Descriptive statistics. Table 4 below presents descriptive statistics of the data. The aim of this paper was to determine the extent to which smallholder farmers' access credit from formal financial institutions, especially commercial banks and informal sources. It is observed that a minority smallholder farmers received credit from the big four commercial banks (Absa = 9.7%, Nedbank = 5.5%; Standard Bank = 4.7% and First National Bank (FNB) = 4.7%). As expected the Land Bank of South Africa was observed to play the leading role (15.5%) in the provision of credit to smallholder farmers.

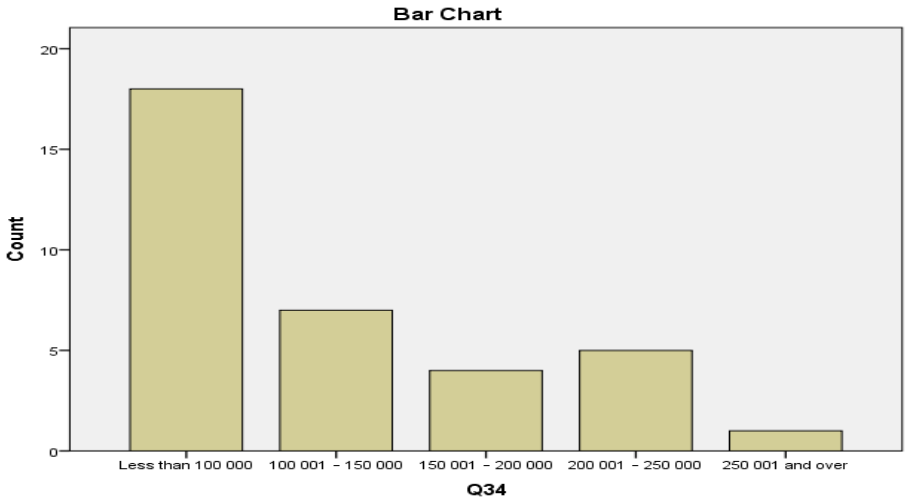
Table 4. Descriptive statistics

Case processing summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	*N*	Percent	*N*	Percent
ABSA	35	9.7%	327	90.3%	362	100.0%
Nedbank	20	5.5%	342	94.5%	362	100.0%
Standard	17	4.7%	345	95.3%	362	100.0%
First National Bank	17	4.7%	345	95.3%	362	100.0%
Land Bank	56	15.5%	306	84.5%	362	100.0%
Stockvels	13	3.6%	349	96.4%	362	100.0%
Cooperatives	6	1.7%	356	98.3%	362	100.0%
Microfinance institutions	15	4.1%	347	95.9%	362	100.0%
Peer farmers	9	2.5%	353	97.5%	362	100.0%
Government	37	10.2%	325	89.8%	362	100.0%
Other	6	1.7%	356	98.3%	362	100.0%

Source: Author calculations based on survey data.

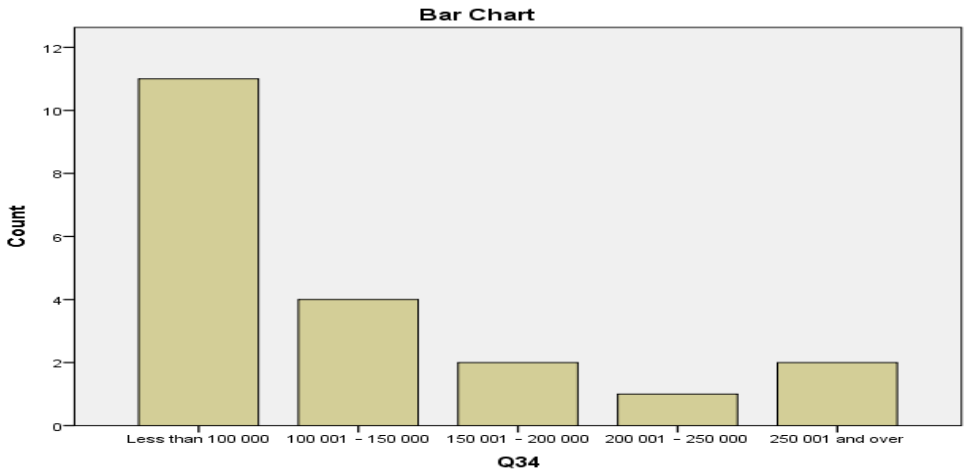
While commercial banks would be expected to lead the supply of credit to smallholder farmers due to their vast experience and expertise in risk transformation, Table 4 above shows that, in fact, informal financial service providers have collectively contributed immensely to the supply of credit to this "forgotten sector", reaching more smallholder farmers than commercial banks. If conventional commercial banks are excluded, government (10.2%), land bank (15.5%, stockvels (3.6%), cooperatives (1.7%), microfinance institutions (4.1%), peer farmers (2.5%) and other unidentified sources assumed to be family, friends, NGOs, traders, contract farming and village banks have contributed substantially to the alleviation of credit constraints experienced by smallholder farmers in South Africa. However, the demand still remains unsatisfied.

Most respondents received amounts less than R100, 000 from each of the big four commercial banks (see Figures 4-9 below). This confirms that access to credit by smallholder farmers from formal financial institutions is limited and therefore smallholder farmers remain credit constrained.



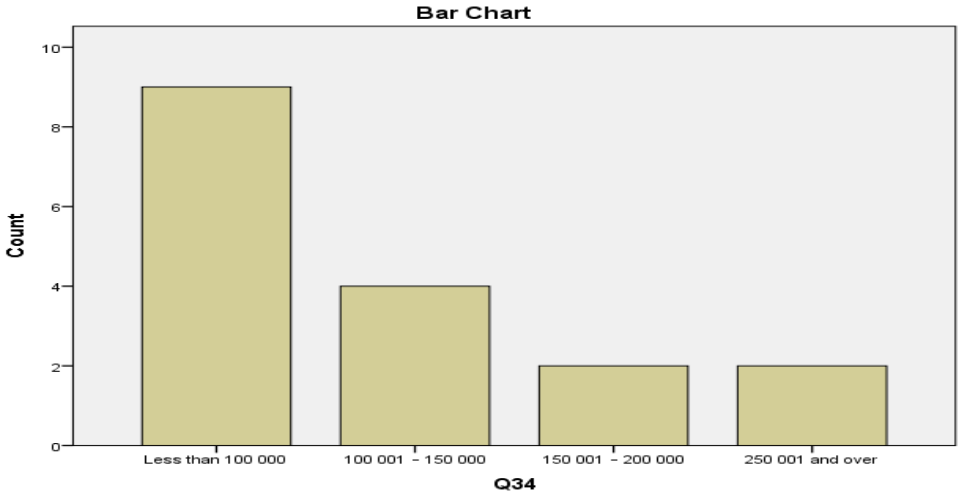
Source: Author calculations based on survey data.

Fig. 4. Credit accessed from ABSA



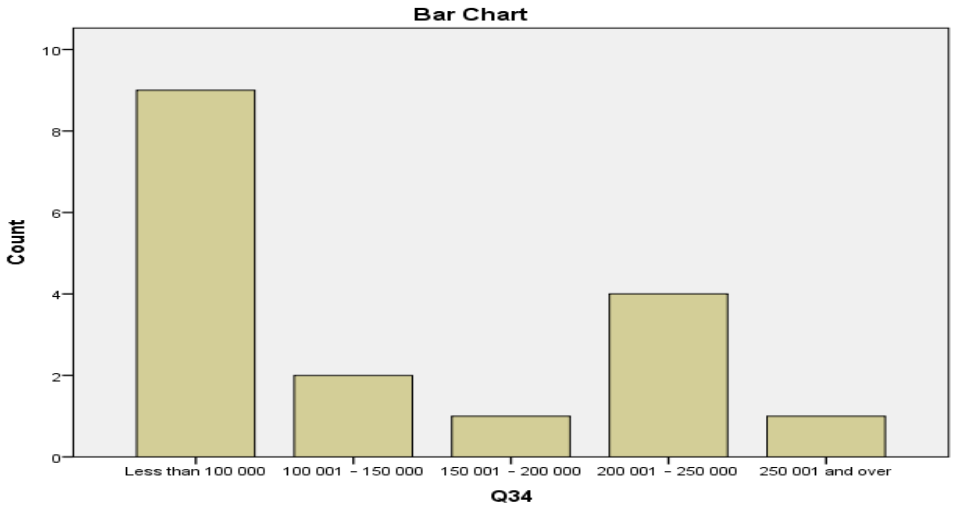
Source: Author calculations based on survey data.

Fig. 5. Credit received from Nedbank



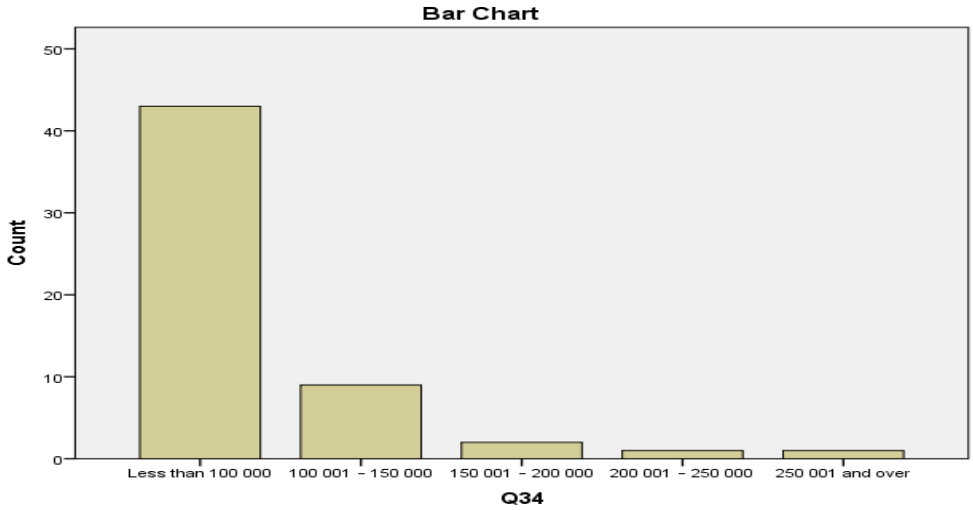
Source: Author calculations based on survey data.

Fig. 6. Credit recived from Standard Bank



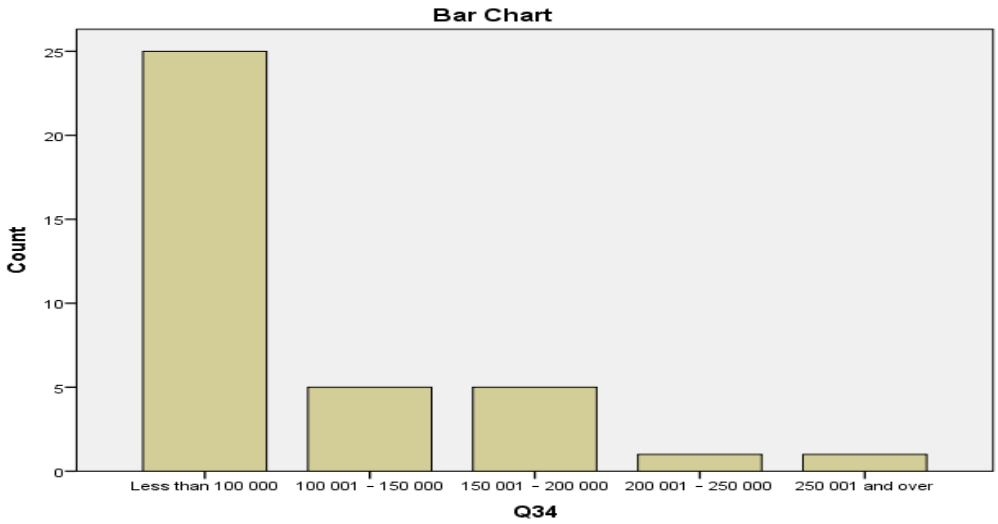
Source: Author calculations based on survey data.

Fig. 7. Credit received from First National Bank (FNB)



Source: Author calculations based on survey data.

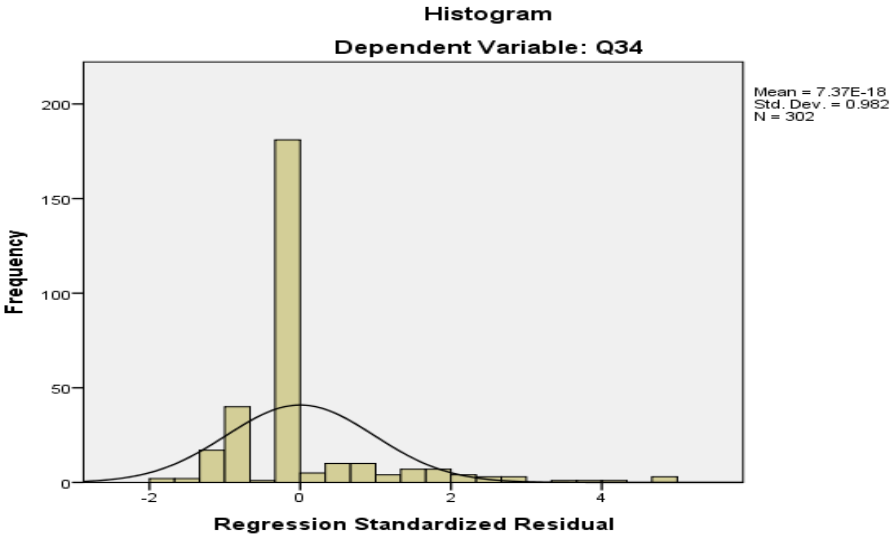
Fig. 8. Credit received from land bank



Source: Author calculations based on survey data.

Fig. 9. Credit received from government

The above analysis shows that most smallholder farmers received amounts below R100, 000; however, it is observed that some smallholder farmers received in excess of R100, 000 and it can be assumed that such exposures would have been fully secured. The residuals were found to be normally distributed as ti is depicted in Figure 10 below.



Source: Author calculations from survey data.

Fig. 10. Normal distribution

4. Model estimation and discussion

The estimated regression model for credit supply portrayed a good fit. Table 5 below shows the model summary and both *R*-squared and adjusted *R*-squared were significant. The Durbin Watson statistic of 1.993 satisfies the minimum criterion for goodness of fit (1.4 DW 2.4). The Analysis of Variance (ANOVA) confirmed the overall model significance at 95% as shown in Table 7.

Table 5. Model summary

Model summary[b]										
Model	*R*	*R*-square	Adjusted *R*-square	Std. error of the estimate	Change statistics					Durbin-Watson
					R square change	*F* change	df1	df2	Sig. *F* change	
1	.396[a]	.157	.125	.819	.157	4.911	11	290	.000	1.993

Notes: [a] Predictors: (Constant), other, cooperative, peer farmers, microfinance institution, Nedbank, Stockvels, FNB Bank, government, Standard Bank, Land Bank, ABSA Bank. [b] Dependent variable: credit supplied.

Table 6. Analysis of variance

ANOVA[a]						
Model		Sum of squares	df	Mean square	*F*.	Sig.
1	Regression	36.269	11	3.297	4.911	.000[b]
	Residual	194.698	290	.671		
	Total	230.967	301			

Notes: [a] Dependent variable: credit supplied. [b] Predictors: (Constant), other, cooperative, peer farmers, microfinance institution, Nedbank, Stockvels, FNB Bank, government, Standard Bank, Land Bank, ABSA Bank.

The estimates of the regression model are shown in Table 7 below. The reported standardized coefficients show the extent to which the predictors contribute to the model fit. All private commercial banks were observed to contribute significantly to the supply of credit to smallholder farmers in South Africa. When ranked, ABSA Bank is observed to make the highest contribution (beta = 0.190), followed by Nedbank (beta = 0.186), First National Bank (beta = 0.184) and Standard Bank (beta = 0.126). What is interesting is that the Land Bank which is mandated to finance agriculture and agricultural related activities contributes an insignificant amount of credit to smallholder farmers (beta = 0.003). These results should be read with caution as the credit supplied by commercial banks is only to a few of the smallholder farmers and is assumed to be collaterized.

The study reveals that informal credit suppliers contribute a minute percentage of total credit to small-

holder farmers when compared to commercial banks. For instance, the coefficients for stockvels (beta = -0.034; p = 531) and cooperatives (beta = -0.018; p = 738) are negative though insignificant, suggesting that they are not playing an important role in the supply of credit to smallholder farmers. Furthermore, microfinance institutions (beta = 0.004), peer farmers (beta = 0.010) contribute a negligible amount of credit to smallholder farmers which may be attributed to their lack of capacity and expertise in extending and managing credit. Apriori, government was observed to be making a significant contribution to credit supplied to smallholder farmers (beta = 0.136). Family and friends, assumed to be the variable "other", were found not to contribute significantly (beta = 004) suggesting that unless one accesses institutional credit, you have to be self-financing. The coefficients of determination (both R^2 = 0.157) and adjusted R^2 = 0.125) confirm that the amount of credit supplied to the smallholder farmers is explained by the predictor variables. The coefficient of determination must fall between 0 and 1. If close to zero, the predictor variable explains very little of the endogenous variable while if close to 1, the exogenous variables explain most of the variation in the endogenous variable. These results fail to support the null hypothesis, suggesting that private commercial banks, alongside government are the major suppliers of credit to smallholder farmers in South Africa.

Table 7. Regression analysis using ordinary least squares with credit supplied as dependent variable

Coefficients[a]								
Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	95.0% confidence interval for B	
		B	Std. error	Beta			Lower bound	Upper bound
1	(Constant)	1.174	.064		18.485	.000	1.049	1.299
	ABSA Bank	.533	.157	.190	3.405	.001	.225	.841
	Nedbank	.326	.096	.186	3.400	.001	.137	.515
	Standard Bank	.164	.071	.126	2.300	.022	.024	.305
	FNB Bank	.180	.054	.184	3.305	.001	.073	.287
	Land Bank	.001	.029	.003	.048	.962	-.056	.058
	Stockvels	-.024	.039	-.034	-.626	.531	-.101	.052
	Cooperative	-.018	.053	-.018	-.334	.738	-.123	.087
	MFI	.002	.029	.004	.073	.942	-.056	.060
	Peer farmers	.006	.031	.010	.189	.850	-.055	.067
	Government	.038	.015	.136	2.491	.013	.008	.067
	Other	.002	.034	.004	.069	.945	-.064	.069

Conclusion and policy implications

South Africa's rural population is credit constrained. The purpose of this paper was to determine the nature, characteristics and span of rural credit markets in South Africa. In this paper, it has been demonstrated that rural credit markets in South Africa comprise of public and private institutions. Like many other developing countries, South Africa's rural population is credit constrained. Using a combination of descriptive statistics and multiple regression analysis of data gathered from Mpumalanga and North West provinces, the study has shown that commercial banks extend larger amounts of credit to smallholder farmers than informal lenders. However, less farmers access credit from commercial banks than from government, the Land Bank and informal lenders put together. This is despite the fact that credit or finance is one of the factors that significantly contribute to agricultural output growth (Machethe, 2004; Chisasa and Makina, 2013). It determines the pace and pattern of socioeconomic development, facilitates as well as stimulates the development process (Bhatt, 1989, p. 15).

The study shows that policy interventions are required urgently to capacitate informal lenders who appear to have a wider reach of smallholder farmers than commercial banks. The South African Government should invest more in education and infrastructure such as technology based banking facilities which minimizes the cost of offering financial services to the rural poor. The primary policy intervention required for commercial banks is in the area of information gathering and methods of reducing information asymmetry, private transaction costs and facilitating access to credit by many smallholder farmers in order to stimulate growth and reduce poverty.

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