Analysis of Savings' Determinants among Smallholder Cash Crop Farmers: A Case Study of Polokwane Local Municipality, Limpopo Province, South Africa

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Abstract

Smallholder cash crop farmers form part of the economy's growth potential and savings are enormously important for the stability of their farms. This study examined the savings' determinants among smallholder cash crop farmers in Limpopo province South Africa. A non-probability sampling technique called purposive sampling was used in selecting 70 smallholder cash crop farmers as respondents for this study. Some of the preferred cash crops grown by the farmers in the study area include maize, potatoes, tomatoes, butternut, and groundnuts. The binary logistic regression model's result on factors influencing savings among these farmers were farm income (p<0,050), household size (p<0,014), farm size(p<0,045), membership of cooperative or association(p<0,018) and financial literacy(p<0,048).The major constraints militating against savings in the study area were the cost of labour, financial illiteracy, and banking costs. The study recommends that strategies to increase smallholder cash crop farmers' income must be harnessed through provision of other income generating opportunities and that smallholder cash crop farmers should be provided with financial literacy education to enhance their income earning and savings capacity.

Keywords: Cash crops, Determinants, Polokwane, Smallholder farmers, Savings, South Africa.

Introduction

Cash crops bring substantial wage and employment opportunities to the rural economy (Achterbosch*et al*., 2014) and according to Zhang *et al*. (2017), cash cropping is traditionally identified as an important enterprise undertaken by farmers to increase incomes. Smallholder cash crop farmers form part of the economy's growth potential. According to Senthilkumar (2017), the growth of cash crops has significant potential for bringing about faster development of agro-based industries. Savings remain a driving force of economic stability (Ebissa and Kassie, 2017).According to Zeller and Sharma (2000) as cited by Osondu*et al*. (2015), savings are very imperative for accumulation of capital required to generate future income, enable future consumption, and provides a form of a bulwark to help people cope in times of crisis. Cash crops could lead to further commercialization (Achterbosch*et al*., 2014), as a result, if smallholder cash crop farmers have savings, their potential for growth could be accelerated. Saving and growth are strongly positively correlated across countries

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(Carroll *et al.*, 2000), this means that for South Africa to realize growth through smallholder cash crop farming, these farmers in all municipalities need to be able to save from their earnings.A savings background additionally serves as an advantage when the farmer wants to obtain credit. Farmers in South Africa have been faced with environmental catastrophes such as droughts, floods etc. and in most cases, they therefore require a backup for them to rise after these disasters and this is where savings start to become more imperative for smallholder farmers. For smallholder cash crop farmers to maintain stability in their farms, they need to be able to safe for unforeseen circumstances (Musiime and Atuha, 2011). Regardless of how important savings are, South Africa has been characterized by low and declining savings from the household level and farmers usually generate income for consumption without saving. Smallholder cash crop farmers need to build up capital stock on their farms from their own savings (Njamweah and Kidombo, 2018). This is because not all farmers can get agricultural loans or credit from the lending institutions. According to South African Cities Network (2014) the reason for this limited contribution by Agriculture is lack of commitment by the Provincial Department of Agriculture. The Provincial Department of Agriculture lacks commitment to invest into agricultural activities and programmes within their municipality, this means that cash crop farmers in the area should be self-sustained and have the ability to save their earnings in order to maintain stability. Savings in this instance is defined as that part of current income, after the payment of operation costs and direct taxes, that is not consumed immediately but kept for future use. This study therefore attempted to address the following questions:
- What are the socio-economic characteristics of smallholder cash crop farmers in the study area?
- What are the preferred cash crops by the smallholder cash crop farmers?
- What are the factors that influence savings by the smallholder cash crop farmers?
- What are the constraints that militate against savings by the smallholder cash crop farmers?

The aim of this study was to analyze the determinants of savings among smallholder cash crop farmers in Polokwane local municipality of Capricorn district, Limpopo province, South Africa.

Literature review

Smallholder cash crop farmers play a big role in their small proportion in the economy of South Africa and they have the potential to play an important role in livelihoods creation amongst the rural poor DAFF (2012).The Department of Agriculture, Forestry and Fisheries (2012) refer to the smallholder cash farmers as the drivers of growth within the developing and underdeveloped economies.The level of income for every individual plays a vital role in their savings ability. It is stated that the lowest income groups which in most cases are the agricultural labourers or even small farmers have the highest marginal propensity to consume which leads to lowest marginal propensity to save as compared to the other occupational groups (Nayak, 2013). Odoemenem*et al*. (2013) also revealed that income is one of the major

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determinants of saving and has a direct influence on the savings of the small-scale farmers, it is stated that increase in the income of a farmer will lead to savings, this is a positive relationship between savings and income, and it means that the ability to save depends on the level of income. The results of Mamman*et al*. (2018) conform with the resultsof Nayak (2013) in that income affects the savings. Mamman*et al*. (2018) found that income from the farm may likely affect their savings rate and investment in profitable ventures or farms if properly managed either positively or negatively, depending on the level of income.

Browning and Lusardi (1996) as cited by Tesfamariam (2012), found out that family size affect savings in a negative way i.e., people with large families do rarely save compared to those with small families. This means that the higher the household size, the higher the proportion of income required for consumption purposes and therefore the lesser the proportion to be kept aside for saving purposes.According to Carpena*et al*. (2011), financial illiteracy may prevent individuals from opening accounts due lack of familiarity with account-opening procedures or at times it may be the lack of knowledge about the benefits of formal savings.Odoemenem*et al*. (2013) revealed that sex has a significant effect on savings of small farmers and according to their results; male farmers were found to have the propensity to save as opposed to female farmers.Gedela (2012)'s study on determinants of savings behaviour in rural and urban households provided the result that is in line with that of Odoemenem*et al*. (2013) by stating that the saving behaviour of males is better than that of females and the reason behind this is the fact that males, unlike women, men were given the opportunity to learn and acquire knowledge in the fields of financial knowledge, financial skills, and consumer practices while women were left behind.

Research Methodology

Study area
Polokwane Local Municipality is located within the Capricorn District in the Limpopo Province of South Africa. This municipality is the small local municipality which borders the municipalities of Molemole, Greater Tzaneen, Lepelle-Nkumpi, Mogalakwena and Aganang and it accounts for 3% of the province. However, regardless of the size of the municipality, over 10% of the population of Limpopo resides within its boundaries since this municipality has the highest population density in the Capricorn District and serves as the economic hub. Polokwane local municipality 's geographical area is dominated by the rural areas whereby a large piece of land is under traditional authority. This local municipality is 23% urbanized and 71% rural, the largest group within the municipality resides in rural tribal villages (Census, 2011).

Sampling procedure
This study employed a non-probability sampling technique called purposive sampling. According to Etikan*et al.,* (2016), purposive sampling technique is a technique used to select respondents based on pre-determined attributes of a group of people (respondents). The pre-determined attribute in this case was that only smallholder farmers involved in cash crop production were selected for interview.

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Structured questionnaire was administered on a sample of 70 smallholder cash crop farmers in Polokwane municipality of Capricorn district of Limpopo province, South Africa.

Analytical methods

Descriptive statistics are used to discuss the objectives 1, 2 and 4. Binary logistic regression model was employed to analyze the factors influencing savings of the smallholder farmers (objective 3).

General model

$$\frac{\log(pi)}{1-pi} = \beta_0 + \beta_i \sum x_i + \mu_t$$

The binary dependent variable Yi takes the value of 1 and 0. Y =1 if the farmer issaving and Y=0 if otherwise. β_0 is the intercept, β_1 ……β_n are estimated parameters,X_1 ……X_n are independent variables and μt is the error term.The dependent variable (savings) in this study is represented as the ratio of the farm income that the smallholder cash crop farmers can put aside and not use in consumption or in current operating expenses.

Savings = Farming income – consumption and operating expenses. (S = I-C)

Therefore, if the farmer saves (Y =1) then it means that they have a proportion of income which is not used in consumption or operations. If the farmer does not save (Y =0) which means that they do not have a proportion of income which is not used in consumption or operations and as a result, it is concluded that they consume all their earnings.The identified independent variables that potentially affect savingsin this study are gender, age, marital status, household size, education level, financial literacy, farm size, farming experience, farm income, membership in a cooperative or association, access to credit, profit, access to saving information, access to extension service, market access, willingness to save and ownership of farm bank accounts. Fitting the variables into the model, the formula is represented as follows:

Savings/otherwise = β0 + β1 GEN+ β2 AGE + β3 MS+ β4 HS+ β5 EL + β6 FL+ β7FS+ β8FE+ β9FI + β10MC/A+ β11AC+ β12P+ β13AS+ β14AE+ β15MA+ β16WS+ β17BA +μt

Table 1: Table describing variables

Dependent variable	Description	Measurement
Savings	1, if the farmer saves 0, otherwise	Dummy
Independent variables	**Description**	**Measurement**
Gender	1, female. 0, otherwise	Dummy
Age	Age of the farmer	Years
Marital status	1, farmer is married. 0, otherwise.	Dummy

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Household size	Total number of household members	Number of people
Education level	Number of years spent in school	Continuous
Financial literacy	1, farmer is financially literate. 0, otherwise.	Dummy
Farm size	Numbers of hectares of the farm	Hectares
Farming experience	Number of years spent in farming	Years
Farm income	Annual income made from farming	Rands
Membership in a cooperative or association	1, if farmer is a member 0, otherwise	Dummy
Access to credit	1, farmer has access. 0, otherwise	Dummy
Profit	1, farmer generates profit 0, otherwise	Dummy
Access to saving information	1, farmer has access to saving information. 0, otherwise	Dummy
Access to extension service	1, farmer has extension service contact.0, otherwise	Dummy
Market access	1, farmer has access to market. 0, otherwise	Dummy
Willingness to save	1, farmer is willing to save part of their income. 0, otherwise	Dummy
Ownership of farm bank account	1, farmer has farm bank account. 0, otherwise	Dummy

Results and Discussion

The socioeconomic characteristics of smallholder cash crop farmers in Polokwane local municipality are discussed using variables such as gender, age, marital status, household size, education level, financial literacy, farm size, farming experience, membership in a cooperative or association, market access, ownership of farm bank account and access to extension service.The results of descriptive analysis of these socioeconomic variables indicate that the majority ofsmallholder cash crop farmers in Polokwane municipality are males, and the ages vary from 20 years (youth) to over 60 years (adults and old aged). However, most of these farmers of the middle-age group aremarried, and this is further explained by the dominance of the middle-aged group of farmers with household size ranging from one to nine with an average of four members. These farmers have different levels of education from no education to tertiary education and it is discovered that most of them have up to secondary

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education. These farmers dominantly own farm sizes that are less than five hectares and most of them have the farming experience of five to ten years. Most farmers form part of cooperatives. Farmers that have access to extension workersand access to markets in this area are fewer than the those who do not have access to extension services and markets. Themajority of these smallholder farmers in this study area do not bank their farming income or own the farm business banking account.

Table describing socio-economic variables.		
Description	**Frequencies**	**%** n=70
Sex		
- Females	27	38.6
- Males	43	61.4
Age		
- Youth	20	28.6
- Middle age	26	37.1
- Old age	34	34.3
Marital status		
- Single	13	18.5
- Married	32	45.7
- Divorced	6	8.5
- Widowed	19	27
Household size		
- 1-3 members	32	45.7
- 4-6 members	33	47.2
- 6-9 members	5	7.1
Educational level		
- Tertiary	22	31.4
- Secondary	34	48.6
- Primary	12	17.1
- No education	2	2.9
Financial literacy		
- Literate	22	31.4
- Illiterate	48	68.6
Farm size		
- Farm size<2h	25	35.7
- 2h<farm size<5h	30	42.9
- Farm size>5h	15	21.4
Farming experience		
- Farming experience<5years	13	18.6
- 5years<Farming experience<10 years	31	54.3
- Farming experience> 10 years	19	27.1
Membership in a cooperative		
- Member	48	31.4
- Non-member	22	68.6
Access to extension services		
- Access	31	44.3
- No access	39	55.7
Market access		
- Access	29	41.4
- No access	41	58.6
Ownership of farm bank account		
- Farmer owns farming bank account.	4	5.7
- Farmers has no farming bank account	66	94.3

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Cash crops grown by smallholder cash crop farmers.
Smallholder cash crop farmers in Polokwane local municipality have identified a number of cash crops they grow in their farms. The list included maize, spinach, tomatoes, ground nuts, cabbages, beetroots, butternuts, cabbage potatoes, carrots, etc. The most preferred cash crops by the smallholder cash crop farmers in the study area amongst the ones listed are maize, potatoes, tomatoes, spinach, cabbage, butternut, and groundnuts. Some farmers produce two or three cash crops rotationally.

Savings determinants
Out of the seventeen explanatory variables that were identified as potential variables that could affect the farmers' savings only five of these variables were found to be statistically significant and these the farm income, household size, farm size, membership in a cooperative or association and financial literacy. Table 2 below provides the summary of the results from the binary logistic regression.

Table 2: Results from the binary logistic regression model

	Coefficient	*Standard error*	*Wald*	*Significance (p-Value)*
Gender	0.688	1.332	0.156	0.605
Age	0.148	0.092	1.608	0.109
Educational level	-0.721	0.641	1.125	0.261
Marital status	1.633	2.342	0.697	0.486
Farm income	1.885**	0.961	1.961	0.050
Farming experience	-0.135	0.997	0.135	0.892
Access to credit	-0.338	0.419	0.807	0.420
Marital status	0.819	1.178	0.695	0.487
Access to credit	0.138	0.081	1.708	0.104
Access to saving information	-0.821	0.631	1.112	0.271
Access to extension services	1.833	2.452	0.665	0.586
Market access	-0.238	0.427	0.701	0.520
Ownership of bank account	0.819	1.168	0.595	0.887
Household size	-4.618**	1.870	2.470	0.014
Farm size	3.551**	1.760	2.018	0.044
Membership of a cooperative/ association	-0.098**	0.041	2.389	0.018
Financial literacy	0.073303**	0.040	2.824	0.048
Constant	-7.690	4.967	1.548	0.122

***1% level of significance, **5% level of significance and *10% level of significance
Table 3: Model summary

Summary

N (sample size)	70
-2 Log Likelihood	29.636
Cox & Snell square	0.621
Negelkereke R Square	0.871

Farm income
Farm income was found to be positively and statistically significant ($p<0.050$) at the 5% level of significance. Meaning that there is a positive relationship between farm income and savings so, the unit increase in the farm income increases the probability of the farmer being able to save. The implication is that-65the more the farm income, the more likely the farmer's ability to save. Obalola, Audu and Danilola (2018) acknowledged that farming income is an important variable determining the savings by farmers and stated that the higher the farm income the farmer generates, the more likely a farmer would save or accumulate capital to meet investment demands. This further agrees with the study of Odoemenem*et al.,* (2013) who revealed that income is one of the major determinants of saving and has a direct influence on the savings of the small-scale farmers, it is stated that increase in farm income will lead to savings.

Household size
Household size was found to be negatively and statistically significant ($p<0.014$) at the 5% level of significance. Meaning that the relationship between the household size and savings is negative and the unit increase in the household size reduces the probability of the farmer from engaging into saving. This finding is in line with the findings of Mamman (2018) as it was reported that the household size of the smallholder farmers has a negative influence on the savings capacity of the respondent. Therefore, the larger the household size, the smaller the savings by the farmer. The reason behind this could be that when a farmer has the larger household, he/she has more members depending on the farm income. This therefore militates against their ability to save from that farm income because the larger proportions of the farmers incomeis consumed in the household instead of being kept aside for savings. It is harder for farmers who have more dependents to have surplus income which can be allocated as savings.

Farm size
The farm size of these smallholder cash crop farmers was found to be positively and statistically significant ($p<0.044$) at the 5% level of significance. Meaning that there is a positive relationship between farm sizeand the savings. Therefore, the unit increase in the farm size increases the probability of the farmer to save form the income they generate. The implication here is that farmers who own bigger farms are more likely to save. This outcome follows the findings of Mamman (2018);Orebiyi and Fakayode (2005) as cited by Tesfamariam (2012) who found out that the farm size of the smallholder farmers has a positive influence on the savings capacity of the farmer

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and this means that the larger the farm size, the higher the farmers' potential to save. Therefore, it can be concluded that farmers with bigger farm sizes utilize the larger farm size to grow and nurture their crops and make more profit than the farmers with smaller farm sizes and as a result, the greater potential to save as it has already been discovered that the income has the positive influence on savings.

Membership in a cooperative or association
Membership of the farmer in a cooperative or association was found to be negatively and statistically significant (p=0.018) at the 5% level of significance.Meaning that the relationship between the membership in a cooperative/association and savings is negative and the farmers' membership in a cooperative/association reduces the probability of the farmer from saving. These results are astonishing because the positive effect of this variable was expected on savings. It was expected that the membership in a cooperative or association by a farmer will result in the increase in the probability of saving by the farmer. The expectation was from the notion that farmers that form part of a corporative or association are exposed to information that benefit their farming businesses and savings benefits is one of them. Unfortunately, the results of the analysis in this study do not agree with the notion. It can be deducted that the negative relationship is caused by a high number of farmers who are part of cooperatives or associations but do not save due to the fact that they rely on such groups to assist them in times of risks and loss in their farming activities. It can therefore be deducted that farmers that belong to cooperatives and associations are too reliant on such groups and are not independent enough to consider farm savings and the groups do not encourage them to save.

Financial literacy
The financial literacy acquired by the smallholder cash crop farmer was found to be positively and statistically significant (p<0.048) at the 5% level of significance. This means that there is a positive relationship between the farmers' financial literacy and saving and the unit increase in the financial literacy increases the probability of the farmer having the ability to save. The implication is that the more financially educated the farmer is, the more likely will the farmer know the importance and potential benefits of saving and ultimately want to save. Ebissa and Kassie (2017); Carpena*et al.*, (2011)acknowledged that financial literacy is an important variable determining the savings by farmers regardless of the level of education and the results of this study follows thefindings in that, the level of education was found to be insignificant while the specific financial literacy was found to be positively and statistically significant when it comes to savings. Those that have financial planning in the study of Ebissa and Kassie (2017) where found to be more likely to save and According to Carpena*et al*., (2011), financial illiteracy may prevent individuals from opening accounts as they may be lacking the knowledge about the benefits of formal saving.

Constraints to savings of among smallholder farmers
Smallholder cash crop farmers show interest in savings but do not save. Out of the 70 farmers who participated in this study, 100% agreed that saving is important in

a farming business but only 20% (14 farmers) indeed save through cooperatives and both personal and the bank accounts while only 4 farmers of the group own farm business banking accounts. Four (4) major constrains that militate against savings by smallholder cash crop farmers where identified and these constraints are the farmers' farm income, the cost of their labour, financial illiteracy and banking costs.

Farm income

The key constraint identified by the smallholder cash crop farmers in Polokwane local municipality is lower income generation. Regardless of how they put effort in producing the quality crops they can never sell at the higher price than the one that is already in the market because their main market is the people around the residential areas who actually settle for cheaper crops from the super markets without taking into account the level of quality . Farmers are therefore, compelled to sell at the lowest possible market price because they want to avoid loss since their major crops are easily perishable. As a result, these farmers find themselves generating lower incomes than what they had anticipated earlier before growing the crops.

Cost of labour.

Smallholder cash crop farmers in Polokwane local municipality are dominantly relying on family labour and if the members of the family have other commitments outside the farm, such as school, work; farmers have to hire extra labour and the labour may be seen as cheap but they undoubtably take a larger portion of the farmers' income. The farmers are always remaining only with enough just to sustain the farm by purchasing inputs and enough to contribute to their households with nothing extra that is available for them to be able to keep aside for savings.

Financial illiteracy and banking costs

A very small percentage of smallholder cash crop farmers own business (farm) bank accounts in Polokwane local municipality. Most farmers showed no interest in owning a business account for their farms. Most of them are financially illiterate and see no benefit in bank accounts. This is in line with what Carpena*et al.*, (2011) stated in their study. According to Carpena*et al.*, (2011), financial illiteracy may prevent individuals from opening accounts due lack of familiarity with account-opening procedures or at times it may be the lack of knowledge about the benefits of formal savings.Farmers that were identified to have financial knowledge explained how banking costs affect their ability to save, they stated in their responses that banking costs of small business accounts are high, the monthly payments are over R80.00 and for them, it means a huge portion of their monthly sales given that their crops are seasonal and do not guarantee sales on a monthly basis but on the harvest and selling period.

Conclusion and Recommendations

There is a positive relationship between savings and farm income, farm size and financial literacy while there is anegative relationship between savings and household size and membership in a cooperative or association. Constraints that militate against saving by smallholder cash crop farmers in the study are their lower farm incomes, the high cost of their labour, financial illiteracy and banking costs. In light of this study, it is recommended that strategies to improve farmers' income must be harnessed

through provision of other income generating opportunities within and outside their farming activities, and that smallholder cash crop farmers should be provided with financial education as well as low-cost farm business banking services.

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