

Determinants of Cash-savings of Farmers in Rural Savings and Credit Cooperatives in Southern Ethiopia

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Authors' contributions

This work was carried out in collaboration between both authors. Author NK designed the study and edited and finalized the final draft and author AAN managed the literature searches, performed the statistical analysis and wrote the first draft of the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: Rural Savings and Credit Cooperatives are important financial institutions in remote villages of Ethiopia offering avenues for savings and credit for farmers and the poor. The aim of this study was to find out the determining factors of farmers' cash-savings in rural cooperatives.

Study Design: The Study design followed was Ex-post facto Design through survey research.

Place and Duration of Study: This study was undertaken in Boloso Sore district (woreda) of the Wolaita Zone, Ethiopia. The study was held between January 2016 and May 2016.

Sample: From six cooperatives of the study district, 116 farmers who had been members of the cooperatives were selected as respondents.

Methodology: Primary and Secondary data were gathered respectively from farmers and district government agencies respectively. The sample size was determined using Yamane formula. The primary data yielded quantitative information on average per capita annual amount of cash-savings by farmers (dependent variable). Similarly, data was gathered on 13 possible determining factors

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(variables) to explore their regression over the Annual per capita Cash-savings (Dependent variable). Multiple Linear regression technique was deployed to find out the strength of relationship between independent variables and the dependent variable.

Results: Descriptive statistics of the study showed that average per capita farmer annual saving in cooperatives was 297 ETB (USD 13). The parameter estimation of the linear regression model revealed that out of 13 variables tested, eight (8) were found to be significant at different probability levels. Size of land holdings, amount of on-farm income, amount of non-farm income, amount of loan, and access to training are positively and significantly related to the level of farmers' average annual savings. On the other hand family size of respondent, total expenditure and credit beneficiary status of respondent was negatively and significantly related to the level of farmers' average annual savings in cooperatives.

Conclusion: As anticipated, assets possessed by farmers and their income were found to enhance the per capita savings of farmers in cooperatives. Corollary to this finding was that those resource poor and income poor had difficulty in savings. The cooperatives may have to design different strategy for encouraging savings among them. Similarly, family size and expenditure were inversely related to savings, for obvious reasons. Thrift habit was recommended to be inculcated among farmers having large family size and expenditure. Training was proved to be a game changer in terms of ensuring higher farmers' savings. The cooperative management could consider frequent cooperative training of farmers for mobilizing higher savings.

Keywords: Cash-savings; rural finance; RuSACCOs; farmers' cooperatives.

1. INTRODUCTION

It has been proved beyond doubt that the poor have the capacity and inclination to save money to mitigate risk. In low-income communities, most people prefer to save their cash in undisclosed places. This may be on the roof, pot, walls, underground, or under a bed. This encompasses risk of theft, damaging by termites and loss in case of fire [1]. Savings and credit scheme aims at poverty alleviation to the poor and low income families [2]. Small farmers are poor in general especially in African and Asian countries. They have limited access to commercial bank deposit and credit; high interest rates charged by non-institutional lenders were important factors that led governments, donors to promote alternative rural saving, and credit institutions (cooperatives) in developing countries. The distribution of credit by government owned or sponsored rural financial institutions have frequently been skewed in favor of the wealthier and more influential farmers. The agricultural development banks and other rural lenders, frequently fail to reach low-income producers with affordable credit have that led to a search for other arrangements to achieve this objective. Savings and credit cooperatives (SACCOs) are becoming popular to the developing countries [3,4].

A Savings and Credit Co-operative is a democratic, unique member driven, self-help co-operative. It is owned, governed and managed by its members who have the same common

bond; working for the same employer, labor union, social fraternity or living/working in the same community. A Savings and Credit Co-operatives membership is open to all who belong to the group, regardless of race, religion, colour, and gender or job status. Members elect a board that in turn employs staff to carry out the day-to-day activities of the SACCO. Members also elect a supervisory committee to perform the function of an internal audit [5,6].

However, lack of awareness and poor saving culture, weak governance, policy and regulatory environment, weak institutional capacity, low capital base and inappropriate loan security requirements were among the challenges affecting the outreach and sustainability of SACCOs [7]. Members' participation is the determinant factor for the sustainable growth of cooperatives. In Ethiopia, studies have revealed that 78.7% of the members became members in cooperatives forcefully by cooperative promoters. As a result, the members' were not aware of the benefits, duties, and rights they have in the cooperative societies, largely the participation of members was weak [8].

In the rural areas, credit, as an instrument, could break a vicious circle of low capital, low productivity, low income, and low savings [9]. In Ethiopia, farmers have been out of reach of banks and other mainstream financial institutions. MFIs have been operating in rural areas and they have limited capacity to accept

savings and lend to farmers. RuSACCOs are community based financial intermediaries set up in each village to cater to the needs of smallholder farmers and other low-income households. Despite these facts, there has been poor savings culture among farmers in RuSACCOs and per capita saving is far from expected levels.

2. LITERATURE SURVEY

Oxfam America Inc. [10] noted that, three-quarters of the world's poorest people do not have a formal saving account. With few viable means to save, these individuals and their families are vulnerable to life-threatening hardships. Yet, savings is the cornerstone or the foundation for financial inclusion, as wide-scale savings mobilization is fundamental to building inclusive financial systems. Saving constitutes the key elements on which the development of the society depends. Local savings provide the asset for the society's investment in future. Savings can be defined as the sacrificing of current consumption to increase the availability of resources for future consumption (needs). It can also be defined as the part of a member's income that has not been spent but rather stored for future use or invested in income generating activities so that it can earn more income in the future [11].

One of the pillar objectives of SACCOs is to promote a saving culture amongst their members. Some of reasons for saving by the members of SACCOs include: for smoothening the household cash flow, or protect the households against the uneven income stream, accumulation of wealth, saving for future investment, or as a means of insurance (Rwanda Cooperative Agency). SACCOs have enabled the savers to acquire the capacity to build low cost, yet high quality, housing units, and to buy vital household items. And send their children to affordable school system and SACCOs have enabled members to use the loans in agricultural development thereby increasing the productivity in the agricultural sector and enhancing food security [12].

One of the most important functions of financial institutions is the provision of services such as checking and savings accounts. These accounts are the most basic financial assets that households own and when held in insured depository institutions, provide a safe place to

keep money, create opportunities to build wealth, and often serve as prerequisites for obtaining other forms of credit. Households without such transaction accounts face a number of financial disadvantages [7].

A few studies focused on factors behind savings culture of SACCO members. Lack of awareness and poor saving culture, weak governance, policy and regulatory environment, weak institutional capacity, low capital base, and inappropriate loan security requirements were among the factors affecting the savings of members in SACCOs [7].

SACCO members tend to lose confidence and that in turn affects their savings behavior owing to several reasons. The principal ones included: capital misuse, misappropriation by leaders, poor administrative skills, irresponsible lending to members, and limited access to banking services too long periods between audits [13].

Members' participation through savings and loan-taking is the determinant factor for the sustainable growth of cooperatives. In Ethiopia, however, 78.7% of the members became a member in cooperatives forcefully by cooperative promoters. As a result, the members' were not aware of the benefits, duties, and rights they have in the cooperative societies; largely the participation of members was weak [14].

According to Ethiopian Federal Cooperative Agency (2014), poor savings culture of members, nonexistence of a clear cooperative law and policy package, lack of adequate capacity to lead and manage cooperatives, lack of finance are the main challenges of Ethiopian cooperatives.

Most of the researches held in Southern Ethiopia found the members' savings participation were poor. However, reasons for the members' poor participation were not adequately investigated. There is a research gap that needs to be fulfilled. Considering the research gap in view, this study attempted to assess the determinants of the level of savings of farmers in RuSACCOs so as to suggest policy and programme interventions to bolster farmers' savings.

Therefore, the objective of study was to explore the determinants of cash-savings of the farmers in RuSACCOs in Boloso Sore District of Wolaita Zone, Ethiopia.

3. METHODOLOGY

3.1 Description of the Study Area

3.1.1 Boloso sore district (Woreda¹)

Boloso Sore *Woreda* is found in SNNP Regional state of Wolaita Zone. The *Woreda* is located about 29 km north from Sodo town and has an altitude of 1800 mean sea level.

3.1.2 Socio-economic aspects of the study area

Agriculture is the mainstay of the *Woreda's* economy and livelihood for 90 percent of the population. The main sources of income for the farmers in the area are production of crop and livestock, which accounts for about 80 and 20 percent of total income of the farmers respectively. The farm sizes are very small per farmer and because of these farmers undergo subsistence farming system and generally, the area characterized by mixed farming activities. The average size of landholding of the area is below 0.5 hectare per farmer. The main crops grown in the area are maize, enset, cereals, pulses, root crops, fruits, vegetables and cash crops. The cropping patterns applied by farmers are intercropping and crop rotation. Intercropping is very widespread practice due to shortage of land. The main farm inputs used by the farmers are improved seeds and fertilizers (DAP and Urea). The other economic activities include trade, tannery, pottery etc.

The *woreda* has 29 administrative kebeles and totally 39,179 households. Among those kebeles 28 have saving and credit cooperative societies, encompassing 7,845 members of which 5009 are male and 2836 female and total capital of around 519,578.00 ETB. The major types of service delivered by cooperatives for their members are saving and credit services. This study focuses on the underlying factors of rural household's level of savings in relation to rural savings and credit cooperatives [15].

3.2 Sample Size and Sampling Procedure

This section describes the sample size and sampling procedures.

¹Woreda is Ethiopian name for District. Kabele is the lowest administrative unit (a typical Ethiopian village)

3.2.1 Sample size

The data for this study was obtained mainly from RuSACCOs farmer-members of Boloso Sore *Woreda*. To determine sample size Taro Yamane [16] mathematical formula was used as shown below:

$$n = N / 1 + N(e)^2 \quad (1)$$

Where:

- n = Sample size;
- N= Total number of RuSACCOs members in the selected Kebeles;
- e = Error margin, fixed as 9% (0.09);
- n = $1870 / 1 + 1870 (0.09)^2 = 116$

Based on the above sample size calculation, 116 sample farmers who were members of RuSACCOs were obtained.

3.2.2 Sampling procedure

Multistage sampling technique was used for this particular study. In the first stage, Boloso Sore *Woreda* was selected purposively on the basis of the fact that cooperatives in the *woreda* are vibrant. The *woreda*, however, lags behind others in terms of access to the livelihood capitals; landholdings, credit, and education, farm input and cooperatives by the poor households and on top of it high population pressure. Second stage, one kebele was randomly selected from each of six primary cooperatives (namely 1, Dubo, 2, Danigara Madalecho, 3, Afama Bancha 4, Gara Godo, 5, Matala Hemebecho, 6, Weyibo) demarcated by co-operative system in the *woreda*. This ensures those kebeles located under each cooperative have homogenous characteristics with respect to saving condition, population density, and the selected kebeles represent the saving and credit cooperative situation of the area. In the third stage, lists of famers in each selected kebele obtained from RuSACCO offices were used as sampling frame. Totally, sample size (n) in each Kebele was selected based on its proportion to the membership size (N). To select sample members simple random sampling method was applied.

3.3 Sources and Methods of Data Collection

In this study, both primary and secondary data were utilized. The primary data were collected

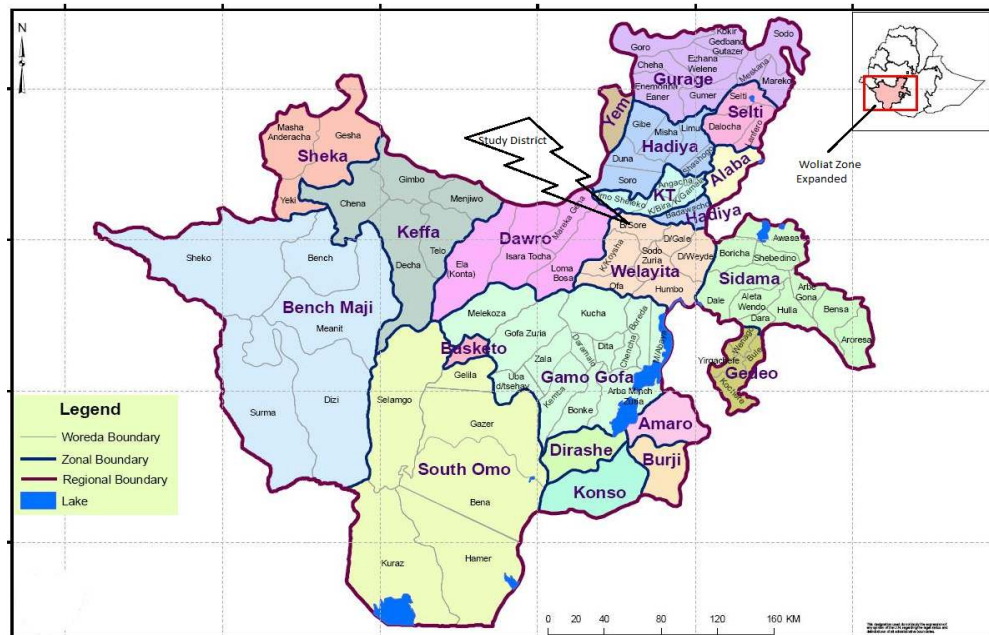


Fig. 1. Location map of Boloso Sore Woreda (District) of Wolait zone, Ethiopia
 Source : WoAD (2014)

from the sample farmers who are members of rural savings and credit cooperatives (in the sample Kebeles) by using a structured interview schedule. All demographic, socio-economic, psychological and institutional variables that are related to the members' in cash savings were collected.

Secondary data were gathered from the different records of rural savings and credit cooperatives; woreda Cooperatives Promotion Office; Woreda Agriculture and Rural Development Office; Woreda Health Office.

3.4 Definitions of Variables and Working Hypotheses

3.4.1 Dependent variable

The dependent variable for this study is the level of cash savings. The level of members' savings in Ethiopian Birr (ETB) considered. The annual average savings deposited by the members in RuSACCO during the past three years (2012/13, 2013/14 and 2014/15) was taken as the measure.

3.4.2 Independent variables

The summary of independent variables used in the study are given in Table 1.

3.5 Techniques of Data Analysis - Linear Regression Analysis

In order to identify the factors affecting the cash-savings of the farmers of rural members based on the hypothesized variables, linear regression analysis was employed. Linear regression model is employed to account for (predict) the variance in the linear dependent variable based on linear combinations of interval, dichotomous, or dummy independent variables. Multiple regression can establish that a set of independent variables explains a proportion of the variance in a dependent variable at a significance level (through a significance test of R^2), and can establish the relative predictive importance of the independent variables (by comparing beta weights). One can test the significance of difference of two R^2 's to determine if adding an independent variable to the model helps significantly. The estimates (b coefficients and constant) can be used to construct a prediction equation and generate predicted scores on a variable for further analysis [17].

Regression analysis can also be applied to study how a response variable Y is dependent on more than one regressor variables. For this purpose, a model is adapted to the observations, which can explain Y from all the regressors together. If there are 'm' regressors X_1, X_2, \dots, X_m , then the

Table 1. Summary of independent variables, definition, and unit of measurement

Variables	Type of variable	Unit of measurement	Definition of variables	Priori expectation of relationship (hypothesis)
Age(x1)	Continuous	Year	Age of the member	Positive
Sex(x2)	Dummy	Male/female	Sex of the members'	Positive
Family size(x3)	Continuous	Number	Member's family size	Negative
Education (x4)	Continuous	Year	Education level of the member	Positive
Land size(x5)	Continuous	Hectares	Members farm land holdings size	Positive
Livestock possession (x6)	Continuous	Number of Tlu (tropical livestock unit)	Livestock resource of members in number	Positive
On-farm income(x7)	Continuous	Birr (etb)	The amount of on-farm income in birr	Positive
Non farm income (x8)	Continuous	Birr (etb)	The amount of income generated from non-farm activities	Positive
Rusacco training (x9)	Dummy	Yes / no	Access to training	Positive
Distance to rusacco (x10)	Continuous	Kilo meter	House distance to rusacco office	Negative
Credit beneficiary status (x11)	Dummy	Yes/ no	Credit beneficiaries of member	Positive
Amount rusacco loan (x12)	Continuous	Birr(etb)	Amount of rusacco loan obtained	Positive
Household expenditure (x13)	Continuous	Birr (etb)	Total expenditure	Negative

linear regression model for the observations is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_m X_m + E \quad (2)$$

In this model $\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_m X_m$ is the systematic (or explanatory) part of the model and E is the random (or unexplained) part of the model. The residual term E is again assumed to be normally distributed with expectation 0 and variance σ^2 . The unknown parameters $\beta_0, \beta_1, \dots, \beta_m$ are called the regression coefficients.

Multiple regression model shares all the assumptions of correlation: linearity of relationships, the same level of relationship throughout the range of the independent variable, interval or near-interval data, absence of outliers, and data whose range is not truncated. In addition, it is important that the model being tested is correctly specified. The exclusion of important causal variables or the inclusion of extraneous variables can change markedly the beta weights and hence the

interpretation of the importance of the independent variables [17].

The regression coefficient, β , is the average amount the dependent variable increases when the independent variable increases one unit where other independents are held constant. Put another way, the β coefficient is the slope of the regression line: the larger the β , the steeper the slope, the more the dependent changes for each unit change in the independent.

Dummy variables are a way of adding the values of a nominal or ordinal variable to a regression equation. The standard approach to modeling categorical variables is to include the categorical variables in the regression equation by converting each level of each categorical variable into a variable of its own, usually coded 0 or 1.

Regression coefficients and variance are usually unknown and need to be estimated from observations carried out on various experimental units. In fact, this is done in the same way as the

simple regression analysis, i.e. using the least squares method.

In general, the model estimates $\beta_0, \beta_1 \dots \beta_m$ with those values, for which the sum of squares of Deviations E_i of the measured values Y_i and the expected values $\mu_i = \beta_0 + \beta_1 X_1 + \dots + \beta_m X_m$ the following sum is minimal:

$$\sum_{i=1}^n E^2 = \sum_{i=1}^n (Y_i - \mu_i)^2 = \sum_{i=1}^n (Y_i - B_0 - B_1 X_{i1} - \dots - B_m X_{im})^2 \quad (3)$$

The estimators are noted as $b_0, b_1, \dots, b_m, \hat{\mu}_i E_i$,

The observation Y_i is split up into the estimated expected value $\hat{\mu}_i = b_0 + b_1 X_{i1} + \dots + b_m X_{im}$ and the individual, estimated deviation.

$$E_i = Y_i - b_0 - b_1 X_{i1} - \dots - b_m X_{im} \quad (4)$$

3.5.1 Statistical tests of multi-co linearity problem

Before executing the econometric model, all the hypothesized explanatory variables were checked for the existence of multi-co linearity problem. The problem of multi co linearity may arise due to a linear relationship among explanatory variables. Multi-co linearity problem might cause the estimated regression coefficients to have wrong signs, smaller t-ratios for many of the variables in the regression and high R^2 value. Besides, it causes large variance and standard error with a wide confidence interval. Hence, it is quite difficult to estimate accurately the effect of each variable [18].

Different methods are often suggested to detect the existence of multi co linearity problem.

Among them, variance inflation factor (VIF) technique were employed in the present study to detect the existence of multi co linearity in continuous explanatory variables [18] and contingency coefficient (CC) for dummy variables.

According to Gujarati [18], VIF (X_i) can be defined as:-

$$VIF (X_i) = \{1/(1- R_i^2)\} \quad (5)$$

Where:

R_i is the multiple correlation coefficients between X_i and other explanatory variables.

Selected continuous explanatory variables, (X_i) were regressed on all other continuous explanatory variables, and the coefficient of determination (R_i^2) was constructed for each case. The larger the value of R_i^2 results in higher value of VIF (X_i) which causing higher collinearity between variables. For continuous variables, as a rule of thumb, values of VIF greater than 10, are often taken as a signal for the existence of multi-co linearity problem in the model (if the value of R_i^2 is 1, it would result in higher VIF (∞) and cause perfect multi-co linearity between the variables) [18,17].

In the same line, the contingency coefficients (CC) was computed for dummy variables from chi-square (χ^2) value to detect the problem of multi-co linearity (the degree of association between dummy variables). The dummy variables are said to be collinear if the value of contingency coefficient is greater than 0.75.

$$C.C = \sqrt{\frac{\chi^2}{n + \chi^2}} \quad (6)$$

Where:-

C.C = is contingency coefficient,
n = is sample size,
 χ^2 = is chi-square values.

4. RESULTS AND DISCUSSION

4.1 Savings Trend among Members (Farmers²)

The study presents savings pattern of respondents in the RuSACCOs. Empirical evidences of member savings showed that methods of savings are categorized as savings in cash in the form of deposit. It was found that on average members saved 297 ETB (approx.USD 13) per capita per annum in RuSACCOs in the study area.

The trend of savings exhibited by the sample members of RuSACCOs over the last three years (savings made from 2012 to 2014) showed that there was an increasing trend of members' savings in RuSACCOs. The last three years average annual savings of the respondents was Birr 247.74, Birr 300.57 and Birr 342.87 in 2012, 2013 and 2014 respectively (Table 2).

²In this Article: Members of RuSACCO are small farmers who are members of RuSACCO. The terms members and farmers are interchangeably used in this article.

Table 2. Trend of members’ Savings amount in RuSACCOs (2012 -2014) (n=116)

Savings institution	Years	Savings distributions in birr (etb)			
		Mean per member	Std. Dev	Minimum	Maximum
Rusaccos	2012	247.74	184.83	60.00	960.00
	2013	300.57	261.51	60.00	1450.00
	2014	342.87	309.53	45.00	1340.00
	Overall	297.06	243.698	45.00	1450.00

Source: Field survey data (2016) 1 ETB = USD 0.044

Members of RuSACCOs had been regularly depositing their monthly savings. The amount of average annual savings of minimum 45.00 and maximum 1450.00 birr regular savings made by members in RuSACCOs.

4.2 Determinants of RuSACCO Members’ Level of Savings

As described in Methodology section, to identify the factors affecting the level of cash-savings of members of RuSACCOs, linear regression was used to ascertain the variables. Thirteen variables were hypothesized that significantly influenced the members’ savings level in RuSACCOs.

The linear regression model revealed that out of 13 variables explored, eight (8) were found to be significant at different probability levels. Size of land holdings, amount of on-farm income, amount of non-farm income, amount of loan, and access of training are positively and significantly related to the level of members’ average annual savings. On the other hand family size of respondent, total expenditure and credit beneficiaries of respondent was negatively and significantly related to the level of members’ average annual savings in the RuSACCOs.

The variables that were statistically significant with the savings level of members of RuSACCOs are estimated in Table 3.

On the basis of the results given in Table 2, the multiple linear regression function was estimated as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_m X_m + E \dots$$

and this was empirically shown as:

$$Y = -63.1257 - 43.322(X3) + 148.236(X5) + 0.044(X7) + 0.029(X8) - 0.032(X13) - 185.887(X11) + 0.127(X12) + 113.043(X9) \dots$$

4.2.1 Member’s family size (X3)

The model output indicated that member’s family size was statistically significant with average savings but negatively at less than ten percent significant level. An increase in family size results in decrease in annual average savings by 43.32 Birr (ETB) per annum. This showed that high family size had negative impact on average money-saving do to the spent much money on consumption. The family size increase in the study area meant that the farmers had to meet the family expenses of their children for schooling, food, health expenses, in addition to farm input expenses, thereby leaving smaller amount for savings.

4.2.2 Land holding size (X5)

It was associated with the savings level of members positively and significantly at less than five percent probability level. A unit increase or decrease of land holdings of members of rural savings and credit cooperative societies, will increase or decrease the cash-savings level of members by 148.23 Birr(ETB). The same results were reported by Azhar [4]. land holdings strongly influenced the rate of total saving, since the size of land holding influenced income and income influenced savings positively. This implied that land holding had an influence on the cash-savings level of members of RuSACCOs in the study areas. The farmers having larger land size were found to grow at least cash crops apart from food crops for home consumption, they could engage farm laborers for farm operations resulting in timely operation and better income, they possessed larger livestock, etc. All these might have contributed to higher savings.

4.2.3 The amount of on-farm income (X7)

The amount of on-farm income represented the amount of annual income of farm household members of RuSACCOs generated from on-farm activities. The higher the amount of annual

Table 3. Parameter estimates of the linear regression on farmers cash-savings

Variables	Estimate	Std error	T ratio	Prob> t
(Constant)	-63.125	80.531	-0.784	0.435
Age (x1)	5.057	23.966	0.211	0.833
Sex (x2)	16.467	25.240	0.652	0.516
Family size (x3)	-43.322	22.262	-1.946*	0.054
Education (x4)	18.130	15.111	1.200	0.233
Land size (x5)	148.236	68.689	2.158**	0.033
On farm income (x7)	0.044	0.016	2.700***	0.008
Non farm income (x8)	0.029	0.015	1.918*	0.058
Household expenditure (x13)	-0.032	0.014	-2.343**	0.021
Live stocks held(x6)	6.513	22.598	0.288	0.774
Credit beneficiary status (x11)	185.887	48.430	-3.838***	.000
Amount rusacco loan (x12)	0.127	0.023	5.451***	.000
Rusacco office distance(x10)	-10.564	19.539	-0.541	0.590
Rusaccotraining (x9)	113.043	33.227	3.402***	0.001
r square = 0.807 (80.7 per cent)				
Adjusted r square = 0.782 (78.2 percent)				
F statistics = 55.44				
F significance = 0.000				
Sample size 116				

Source: computed from the survey data result (2016)

Note: ***, **, * is significant at 1, 5 and 10 percent probability level respectively

income might reflect members' strategy of improving its agricultural production and productivity to secure the members basic needs and gradually to change the household members' life style. It was hypothesized that on-farm income is positively related to the level of average annual savings. On-farm income influenced the cash-savings level of members of RuSACCOs positively and significantly at one percent probability level of significance, confirming the hypothesis. A unit increase in on-farm income, the members of rural savings in RuSACCOs will have marginal increase in annual average savings by 0.44 Birr (ETB), other variables held constant. Income of the households positively related to the level of savings. Higher farm income in the study area coupled with farmers thrift habit has resulted in higher savings.

4.2.4 Household expenditure (X13)

The model output indicated that member's total expenditure was statistically significant with average savings but negatively at less than five percent significant level. A unit increase in total expenditure, the members of RuSACCOs decreased their average annual savings 0.032 Birr (ETB), other variables held constant. In the study area, the farmers having larger family size and smaller farm size tended to have higher expenditure for obvious reasons crippling

their ability to save more than what they currently do.

4.2.5 Amount of loan received from RuSACCOs (X12)

It was associated positively and significantly at less than one percent probability level with the savings level of members of the RuSACCOs in the study area. A unit increase for loan from RuSACCOs increased the savings level of members by 0.127 Birr (ETB) under the assumption of *Ceteris paribus*. The reason for this relationship might be the fact that the higher savings amount would naturally have led to higher loan amount. Other reason would have been that higher loan could have enabled the farmers to earn more and the increased income might have been converted into savings.

4.2.6 The amount of non-farm income (X8)

It represented the amount of annual income generated from different non-farm activities of the member. The higher non-farm income might reflect household's strategy of diversifying its income sources with the view to decrease the household income risk. Hence, it was hypothesized that the amount of annual non-farm income was positively related to the level of annual savings. Non-farm income influenced the cash-savings level of members of RuSACCOs

positively and significantly at ten percent probability level of significance, confirming the hypothesis. A unit increase in non-farm income, of the members of RuSACCOs increased average annual savings by 0.029 Birr (ETB), other variables being held constant. Non-farm income like trading of grains in the villages provided risk free income compared to farming and thereby enhancing farmers' disposable income to save in RuSACCOs.

4.2.7 RuSACCO training (X9)

Training was found to be positively and significantly related at one percent probability level related to the members' savings level in RuSACCOs. Participation in training programs on RuSACCOs increased the probability of cash-savings level by 113.04 Birr (ETB), holding other variables constant. This implies that members who had participated in RuSACCOs transaction related training, awareness creation events of savings mobilization; information and education programs increased the amount of savings. Training inspires confidence in members and that would have encouraged them to raise the saving amount in RuSACCOs.

4.2.8 Credit beneficiaries of member (X11)

It was assumed that those members' who were the beneficiaries of credits over the last few years would develop experiences on how to use loan purposefully and enhance the earning potential and consequently the savings potential as well. Since one of the major objectives of RuSACCOs was to offer loan products to the members, those who had credit use experience were expected to be pioneer in the RuSACCO movement. The result of linear regression showed that credit beneficiaries of the members was significant at less than one percent and positively related with savings amount of the members of RuSACCOs. The credit beneficiary status of the members of RuSACCOs increased savings level by 185.89 Birr (ETB) other variables being held constant.

5. CONCLUSION

Savings is the important lendable resource for financial sustainability of any cooperatives and RuSACCOs in particular. Understanding determinants of savings would pave the way for fostering savings. In the study, a total of 13 explanatory variables were considered in the

econometric model to explore the determinants of savings. The estimations of the linear regression model revealed that out of 13 variables tested, eight (8) were found to be significant at different probability levels. Size of land holdings, amount of on-farm income, amount of non-farm income, amount of loan, and access of training are positively and significantly related to the level of members' average annual savings. On the other hand family size of respondent, total expenditure and credit beneficiaries of respondent was negatively and significantly related to the level of members' average annual savings in the RuSACCOs.

Family size and expenditure are not in favor of savings, for obvious reasons. Thrift habit has to be inculcated among farmers having large family size and expenditure. Training is proved to be a game changer in terms of ensuring higher farmers' savings. The cooperative management can consider frequent cooperative training of farmers for mobilizing higher savings.

CONSENT

The respondents were apprised of the purpose of the study, their voluntary participation, confidentiality of the information, etc. and their consent was duly obtained before collecting data.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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