

## Relationship between Sources of Funds and Outreach in Savings and Credits Cooperatives Societies: Tanzanian case

Benson Otieno Ndiege (corresponding author)  
School of Business Management, Dalian University of Technology, Dalian 116024, China  
Tel: +86 15104073498, e-mail: ndiegebenson@yahoo.com

Tito Bartholomew Haule  
Department of Finance & Banking, Moshi University College of Cooperatives and Business Studies, Sokoine Road,  
P.O Box 474, Moshi, Tanzania  
Tel: +255 767101966, e-mail: barthtot@yahoo.com

Isaac Kazungu  
Department of Marketing, Moshi University College of Cooperatives and Business Studies, Sokoine Road,  
P.O Box 474, Moshi, Tanzania  
Tel: +255 713311276, e-mail: isaacist1@yahoo.com

### Abstract

There is continuous and increasing flow of funds from commercial banks and other formal financial institutions to the Savings and Credits Cooperative Societies (SACCoS) in Tanzania. This experience causes contradiction of whether it is blessing or threat to the SACCoS existence. This paper examines the linkage between sources of funds and level of outreach as a performance indicator in SACCoS. We employ panel data which are obtained from Ministry of Agriculture Food and Cooperatives for the period 2005-2012 and analysis is based on panel data regression model. Findings indicate that both external and internal sources of funds are positive and significantly related to outreach. However the results indicate that external sources funds are becoming central part of the SACCoS loan portfolio as compared to internal sources of funds. This is a threat to saving practices in SACCoS. We recommend that policy and rules governing SACCoS indicate clearly the model and level of linkage to maintain the principles, structure and objectives of member-based microfinance.

**Key words:** Tanzania, Microfinance, SACCoS, outreach, external funds and economic development

### 1. Motivation

Over the past two decades microfinance industry has shown a great pace of growth in Tanzania which is an indication of the achievements of financial reforms (Bee, 2007). Financial reform which manifested in early 1980s basically targeted banking system and aimed at stimulating financial market and increase financial services in the country by liberalizing financial sector. Generally this reform increased financial intermediations and for this reason raised financial access in the country (Bee, 2007; Kessy & Urio 2006; Akinboade, 2000; Satta, 1999; Wangwe 2004). Despite these achievements it was also observed that, commercial banks and other non-bank financial institutions failed to reach majority poor people particularly in rural areas because they concentrated in urban areas, and also they needed collaterals which most of the people did not have. As a result microfinance was identified to be the solution for financial problems to the poor and low income earners in marginalized societies (Bee, 2007; Randhawa & Gallardo, 2003).

In general the goals of microfinance are to expand financial markets and services in marginalized areas so as to stimulate investment in local environments. These are important for the increase in employment, productivity, and income, as a means to amplify economic growth and reduce poverty (Kinde, 2012; Nyamsogoro, 2010).

There are different types of microfinance institutions (MFIs) which can be classified as non government (NGOs), non-banks financial institutions, commercial banks through microfinance windows and cooperatives based microfinance. But the scope of this paper is restricted on Savings and Credits Cooperatives Societies (SACCoS). These are member based microfinance institutions which are run under the cooperative principles. As other Cooperatives institutions, SACCoS are user owned, user controlled and user benefited organizations (Mataba, 2010; Temu & Ishengoma, 2010; Bee, 2007).

In Tanzania, SACCoS have creditable effects on the people's life. According to Temu and Ishengoma (2010), Nyamsogoro (2010), Wangwe (2004) and Randhawa and Gallardo (2003), SACCoS are among the main providers of financial services and hence have higher level of outreach especially in rural areas. These cooperatives based microfinance institutions have more population because they are easily formed by people in their locality where people have common bonds like similar location, similar activities or employments and other likes. According to Tanzania SACCoS statistical reports of March 2012 (is the last update when we were writing this paper), most of these institutions are in rural areas, with around 56% of the total of SACCoS situated in rural areas and 44% found in urban. Of course it is not ideal distribution, because though we can think of larger percentage of rural SACCoS, mathematically urban areas have large SACCoS services than rural areas. This is the reality when we consider the population distribution of Tanzania in which rural areas host more than 75% of the total population.

Principally, the performance of microfinance is basically accessed by looking at how well it changes the life of the community involved. In this sense then, various researchers and academician have been working to understand and address how microfinance institutions (MFIs) contribute to economic growth and poverty reduction in different circumstances and environments. In so doing, outreach in microfinance has been among the interesting issues that attract attention of the researchers and other stakeholders, both in its entire meaning and how different types of MFIs attain it. Some researchers who worked on this area include (Kinde, 2012; Temu & Ishengoma, 2010; Nyamsogoro, 2010; Okumu, 2007). The motive behind this studies based on the reality that more people are poor and they need to be reached by financial services and change their life pattern and standards.

Outreach is a common term which has been used in different contents and can be defined differently depending on where it is applied. As well, in microfinance outreach has become a common and important term. According to Okumu (2007) and Temu & Ishengoma (2010), the term outreach in microfinance has been defined differently by different scholars. But both of them concluded that all the ideas fall fewer than two main categories which are breadth and depth outreach. Breadth outreach is defined as the number of people who get financial services from MFIs. Conning (cited by Okumu, 2007) and Lafourcade et al (2005) explained that, outreach of microfinance is extension of financial services to wider population. Obviously by means of these ideas, it implies that increase in outreach in SACCoS is measured by increase in number of active members along with financial services.

According to Hulme and Musley cited by Kinde (2012), any description in MFIs should not exclude poor. Therefore depth outreach is all about how poor are the poorer people who saved by microfinance. In the sense that deeper outreach can be shown by the economic class of those people who are clients of microfinance institutions. In developing countries like Tanzania where there is intense poverty it is expected that small average loans implies reaching more poor people. Lafourcade et al (2005) elaborated that depth outreach measure the social economic characteristics of the MFIs clients. Commonly depth outreach is usually measured by average credits per member, though this proxy is facing critics still no other reliable mean of measurement (Nyamsogoro, 2010). As per scope of this paper the two basic descriptions of outreach are adopted. Then we consider that outreach is an integration of the two (breadth and depth). Our idea is that it should not be possible to conclude on level of outreach in SACCoS by looking on one element otherwise the conclusion may be unsatisfactory itself.

Recent researches identified different factors which affect the level of outreach in microfinance institutions. According to Nyamsogoro, (2010), and Okumu (2007), outreach in MFIs is deeper when microfinance is older, it has big assets (size), located in rural areas, has low cost of outreach (interest charged on loan) and lend in groups. These are generally important factors in microfinance as a whole; however in the context of SACCoS, there is a very important factor of outreach, which is a source of funding. In most cases this factor is ignored or underweighted as determinant of outreach. This component mostly has been used in measuring sustainability and then researchers make links between outreach and sustainability of microfinance. Probably this is good in the context of other types of microfinance like NGOs, but according to the principles and objectives of SACCoS, it is important to understand in specific the direct link between the sources of funding and the outreach because they (SACCoS) are on the whole formed to promote both savings and provision of loans as compared to other microfinance which mostly focus on provision of credits/loans.

Basically, funding in SACCoS depends on internal sources of fund which are contributed by members in form of shares, demand deposits (voluntary savings) and savings (compulsory savings), and external sources of funds which are mainly borrowing from formal financial institutions particularly commercial banks (Nyamsogoro, 2010; Okumu, 2007). Principally, these two are the main source of funds in their loan portfolio. However according to SACCoS objectives and structure (URT, 2002), savings should be the main if not the only source of fund in these institutions.

However, it has many advantage to members, institutions (SACCoS) and national as a whole. By using internal sources in loan portfolio, SACCoS encourage saving among members by providing a safe, convenient and attractive medium for investment, and eliminate hardship by enabling members to borrow at a reasonable rate and minimum conditions (Mataba, 2010; Colombain, 1950). On top of this Okumu (2007) clarified that savings has been an important microfinance product which has significant effect on outreach in three grounds; firstly he said savings is an important financial service required by poor people, secondly it is source of cheap loans to member which is basically required by low income people, and lastly it is has been considered the main component in loan portfolio. Therefore, fundamentally loan portfolio in the SACCoS depend on members internal contributions, which we can also referred to savings (Okumu, 2007). But recently there have been increasingly flow of external funds whereby SACCoS are borrowing from commercial banks and other formal financial institutions (Kinde, 2012; Temu & Ishengoma, 2010). This situation resulted to some mix-up of interpretations among the stakeholders as whether this practice is genuine for the survival, development and hence performance of cooperative based microfinance or not. The main argument is whether the linkage between commercial banks and SACCoS will not affect the principles, objectives and structure of cooperative based microfinance following rapid increase in liabilities in SACCoS. This phenomenon can be evaluated by looking at liabilities (amount of external funds in SACCoS) effects on different performances indicators in SACCoS. Then in this paper we use outreach as the performance indicator to study this connection.

Previous literatures on related idea viewed this link in two main ways; firstly as a mean to broaden financial capacity in SACCoS and secondly as a way SACCoS are becoming agents of commercial banks. For the first observation some scholars including Randhawa and Gallardo (2003) supported that financial linkages between SACCoS and banks are the better solution for financial sustainability of SACCoS. Piprek (2007), using CRDB bank (in Tanzania) as case in point added that linking SACCoS and commercial banks is a way to increase supply of financial services in rural areas. Also his advice was that commercial banks should enter low income market where there is mutual benefit to both SACCoS and commercial banks.

Temu and Ishengoma (2010) used a survey data conducted in 2006 in four regions in Tanzania to study financial linkage and performance of SACCoS. They considered performance as breadth outreach. Also they treated external sources of funds as dummy variables, whereby dummy 1 stand for SACCoS which their average loan from commercial banks per member exceeded Tshs 50,000 and 0 for otherwise, and drew interesting conclusions. According to their report, SACCoS that receives funds from banks have not shown difference in performance from the others which do not. Instead they commented that this linkage is for the most part is increasing outreach cost by increasing interest of loans. However they said that loan size, membership and member growth are insignificant to financial linkage (liabilities) but significant and positively related to internal finances.

Therefore this paper analyzes the relationship between sources of funds and outreach of SACCoS in Tanzania with specific attentions on external sources. It is set to answer two questions; one what is the role of external funds to the loan portfolio and two what is the relationship between external sources of funds and outreach. We use descriptive statistics to answer first question, and in question two we use panel data regression in analysis, as describe in methodology and results in section 3 and 4.

This study is important and useful because; first it is significant to understand how SACCoS as microfinance institutions as well as cooperative institutions continue to fulfill their objectives of reaching majority poor resource people and hence reduce poverty in Tanzania. Therefore this study looks at the meaning of growing linkage of SACCoS formal financial institutions and performance of SACCoS in form of outreach. Second there are few researches reports on either outreach or linkages of SACCoS and formal financial institutions in Tanzania, but also the available reports again end up with different observations. Therefore there is a need to conduct more studies and contribute in finding consensus because the previous researches have shown different conclusions on this issue. This is important for the improvement of ongoing practices in SACCoS. Third this paper differs with all other report through methodology whereby we determine and compare breadth and depth, also in case of types of data we use panel data from cooperative department. Thus it was worth doing this study as it increases knowledge on SACCoS industry particularly on the linkage between SACCoS and commercial banks and other formal financial institutions, hence useful to the members of cooperative microfinance institutions, the government, policy makers, researchers and other practitioners in microfinance industry.

## 2. Data

In this study we employ the financial data published by the Ministry of Agriculture Food and Cooperatives (MAFC) of Tanzania. The information is published by the department of cooperatives under agriculture basic data. Though Tanzania means Zanzibar and Tanzania mainland, this information is from mainland only because information from Zanzibar are not included in these publications of Ministry of Agriculture Food and Cooperatives since cooperatives is not a union sector. Therefore data are compiled from 21 regions in Tanzania mainland for the year 2005-2012. The information that is published include number of members, number of SACCoS, shares, demand deposits, savings, credits and outstanding balances. Then our data set is panel data as it combine both cross-sectional and time series data characteristics, because data for the same variables in all regions were published for the year 2005–2012. Probably there is other information which could have more contributions to our model but not included due to the scope of data. However, we are confident that in understanding the relationship between outreach and sources of funds, the data we have used are adequate to make vital conclusion.

## 3. Methodology

We develop the panel data regression model base on assumption that there is positive relationship between outreach and sources of funds in SACCoS (Nyamsogoro, 2010; Okumu, 2007). The logic is that increases of funds in SACCoS results to breadth outreach because more people join cooperatives following the availability of enough credits. Similarly these increments results to increase in depth outreach because they inflate loan portfolio whereby people are able to access more loans. If percentage change in funds exceeds average loan/credits size then it is a growth of outreach and vice versa (Okumu, 2007). Also we assume that there are two sources of funds in SACCoS which are members' contributions and commercial loans from commercial banks (see Figure I). We also follow the common idea that SACCoS are not basically profit business units and therefore, principally, all money they collected or received is lent to members, and this is the main business of SACCoS. Then all funds in SACCoS are located in loan portfolio.

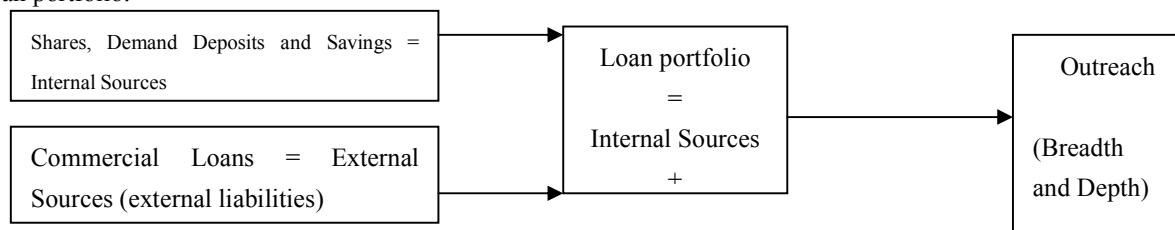


Figure I: Linkage between sources of funds and outreach

Source: Adopted from Okumu (2007) and modified by researchers

From Figure 1 above, outreach is treated as dependent variable using two proxies which are number of members of SACCoS (MEMB) and average credits (AVC) as breadth and depth respectively. These proxies are the common ways of describing outreach in microfinance (Nyamsogoro, 2010; Temu & Ishengoma, 2010; and Okumu, 2007). In our model we have used both two proxies because if they are used together they increase understanding of the nature of outreach and increase accuracy in making conclusion.

The independent variables are external liabilities or external sources of funds (LIB) and which is internal sources (EQT) in loan portfolio. Principally, SACCoS member need to save first and borrow from his/her savings. Therefore, it is the external sources of funds that show the level of dependence of SACCoS. As a result in this paper liability is credits minus internal sources of funds. Commonly, the internal sources of funds for loan portfolio should exclude shares and demand deposits because primarily shares should be invested in other assets rather than using for loans provision, but practically SACCoS do not do that and they use that in lending, so we decided to include it in loan portfolio. Also in banking point of view deposits are basically treated as liabilities of institutions, but for clear understanding of how SACCoS is working, we considered deposits as inputs and therefore the components of internal sources of funds in SACCoS and therefore are components of loan portfolio. Therefore In this paper shares, demand deposits and savings are summed and used as total internal sources of funds in the SACCoS. Also to understand the effects of external and internal sources of funds together, we generate variable another which is the external and sources-internal sources ratio (external sources divided by internal sources) and it is labeled (LER).

Other independent variables include year, number of SACCoS and credit-assets ratio. We use year to check whether outreach change over time. Also we assumed that age of SACCoS determines the level of outreach hence also older

SACCoS have more outreach than new one. It is also our assumptions that SACCoS industry or institutions (SACC) is/are growing and this can be reflected in growth of outreach. Moreover, credit and assets are assumed to have impact to the outreach of SACCoS. Then we used credits per assets (CRAR) to check its impact on outreach. Table 1 show the description of independent variables used in models.

From the Table 1 we developed two basic panel data regression models as in model 1 and 2, where  $\mu_{it}$  is error terms, representing variables which are not included in the models,  $\beta_i$  are coefficients of independent variables and  $t$  means time (in this case year).

$$\text{MEMB}_{it} = \beta_1 + \beta_2 \text{YEAR}_i + \beta_3 \text{SACC}_{it} + \beta_3 \text{EQT}_{it} + \beta_3 \text{LBL}_{it} + \beta_3 \text{CRAR}_{it} + \beta_3 \text{LER}_{it} + \mu_{it} \quad (1)$$

$$\text{AVC}_{it} = \beta_1 + \beta_2 \text{YEAR}_i + \beta_3 \text{SACC}_{it} + \beta_3 \text{EQT}_{it} + \beta_3 \text{LBL}_{it} + \beta_3 \text{CRAR}_{it} + \beta_3 \text{LER}_{it} + \mu_{it} \quad (2)$$

Multiple regression models used to estimate the parameters since we have more than one independent variable. In panel data parameters can be estimated using fixed effect or random regression models (Gujarati 2004). To choose between the two models, whether to use fixed effects or random effects model two models were tested using Hausman test. Following Gujarati explanations on Hausman test, we tested the null hypothesis that both two estimation methods are good enough and they yield similar coefficients and therefore we are supposed to use random effects model. The alternative hypothesis is that the fixed effects estimation is satisfactory and the random effects estimation is not. If alternative hypothesis is true, we would see differences between the two sets of coefficients. Chi-square distributions guide us to reject or not to reject null hypothesis. If the probability of chi-square is less than 10% (significant), null hypothesis is rejected that two methods are good enough in favor of the alternative hypothesis that one is satisfactory (fixed effects) and if probability of chi-square is greater than 10% the null hypothesis is not rejected in favor of random effects.

Then as per Hausman test results in Table 2 for model 1, we have rejected null hypothesis that the two estimations are satisfactory in favor of alternative hypothesis that of fixed effects is good and random effects is not. In case of model 2, according to the results, we have not rejected null hypothesis that the two estimations are satisfactory, in favor of random effects regression model.

Furthermore to ensure that our models are safe from multicollinearity, we centered the original independent variable values by subtracting the means from the cases. Also because we were dealing with panel data it was important to be keen on the presence of heteroskedasticity there was no problem in both models.

#### 4. Statistical Results and Discussion

The objective of this paper is to show effects of sources of financial to the outreach in savings and credits cooperative societies (SACCoS). We started by showing the role of external sources of funds on portfolio/credits. For simplicity we used liabilities-equity ratio and total credits to show the relationship of external sources and loan portfolio/credits as shown in Figure 2. The results in Figure 2(a) show that liabilities-equity ratio are increasing with time (year), meaning that the external funds continued to dominate internal sources in total loan portfolio/credits. However as was found by Temu & Ishengoma, (2010), figure 2(b) show that when SACCoS are young (have small total credits/loan portfolio) the elasticity of demand for external funds is positive. This reaches a maximum and starts to be negative.

In the next step we presented the results for panel data regression models. Table 3 show the results for two models, whereby in model 1 (see column 2) we measured breadth outreach (dependent variable is number of SACCoS members) and model 2 (see column 3) we measured depth outreach (average loan/credits).

Therefore the results show that both external and internal sources of funds contributed to breadth outreach of SACCoS, whereby when we consider their coefficients, the magnitude of external funds is higher than that of internal sources of funds to the outreach. This is contrary to the observation made by Temu and Ishengoma (2010) that only internal source of funds in cooperative based MFIs have impact on their outreach. Also results indicate that increase in number of SACCoS as financial institutions increases access to financial services. Moreover this can be interpreted that the older the SACCoS the deeper the outreach and/or the membership in SACCoS increases with time. In addition the results indicate that growth of loan portfolio is important in growth of breadth outreach.

In addition, column 3 of Table 3 demonstrates the summary of statistical tests for determinants of depth outreach. As well the regression model is best because it had the  $R^2$  (within) of 64% which show high explanation of outreach by explanatory variables. In these results all explanatory variables are significant. However two variables that are institutions (SACC) and loan portfolio asset ratio (CRAR) produce negative signs which are contrary to our hypotheses.

Furthermore the results indicate that average credits are positively related to liabilities (LBL). This implies that as SACCoS continue to get more funds from commercial banks their members also receive higher loan size in average. In outreach concept this can be generally translated as a poor outreach in SACCoS because it is indicated in many studies that higher depth outreach will mean small loans (Nyamsogoro, 2010; Okumu, 2007). But as per this study it is not possible to make such conclusion, because as already explained before in this paper, this depend on the difference between percentage increase in number of members and percentage increase in average credits/loans. As explained by Okumu (2010) if increment in membership exceeds that of average loan than there is increase in outreach and vice versa is true. That analysis is beyond the scope of this paper.

Also the results indicate that increase in number of SACCoS is negatively related to level of average credits/loan. The logic behind this is that having more number of SACCoS means having large number of member and that causes fall in average loans, *ceteris paribus*. Also average loan is negatively related to credits-assets ratio. Moreover equity, year and liabilities-equity ratio show positive relationship to average credits/loan. This implies that liabilities (external sources) are taking the central effects in business of SACCoS, which to the great extent violets cooperative principles as well as microfinance best practices.

### 5. Conclusion

This paper examines the relationship between sources of funds and outreach of SACCoS in Tanzania with specific attentions on external sources of funds. To make keen examinations and conclusions two questions are answered which are; what is the role of external funds to the portfolio, and what is the relationship between external sources of funds and outreach? The results indicate that there is positive relationship between outreach and external sources of funds. This is the case because there is inelastic demand for credit which is due to low living standard among majority of people and also there is growing desires for development among Tanzanian. Definitely SACCoS sub-sector is still very young and also dealing with poor people whom their internal contribution alone might not be large enough to fulfill the demand for credits and as results when there is opportunity to get more credits there would be increase in members and average loan size.

Also the results indicated that the effect of external sources of funds on outreach is bigger than the effects of internal sources on outreach. This is indicating that external funds are becoming central part of the activities of SACCoS as compared to internal sources of funds. Furthermore the results depict that loan/credit has positive relation with liabilities/debt-equity ratio. Also findings demonstrate that liabilities/debt-equity ratio is linearly increasing with time and has serious impact on total loan portfolio/credits. These indicate that increase in flow external funds in SACCoS is growing faster than savings. But as unique type of microfinance, main objectives of cooperative based microfinance are savings which help members to be the owners, controllers and hence dependent. Therefore if growth of external liabilities exceeds that of internal sources, this has negative image on their structures and objectives, because this trend proves that SACCoS are turning to be the agents of commercial banks. If the trend continues the same way, practically, they will no longer be savings and credits cooperatives societies but credits cooperative societies. We recommend that policy and rules governing SACCoS should indicate clearly the model and level of linkage to avoid commercial banks to use SACCoS as their business agencies.

As per the scope of this study, we did not figure out issues like interest rates, governance, financial sustainability and other which might be important in understanding the outcome of this growing linkage between SACCoS and formal financial institutions. Therefore the same study can be done using more secondary and primary data to capture more information. This is important to ensure sustainability of SACCoS and improve ongoing practices in this sub-sector.

### 6. Acknowledgment

The research is supported by the Ph. D. Programs Foundation of Ministry of Education of China (20090041110009), National Science Foundation of Ministry of China (71171032), and the central university special funds for basic research business expenses (DUT11RW202, DUT10ZD107).

### References

- Akinboade, O.A. (2000). The relationship between financial deepening and economic growth in Tanzania. *Journal of international development, J.Int.Dev.12*, 939-950.  
[http://dx.doi.org/10.1002/1099-1328\(200010\)12:7<939::AID-JID668>3.0.CO;2-I](http://dx.doi.org/10.1002/1099-1328(200010)12:7<939::AID-JID668>3.0.CO;2-I)
- Bee, F.K. (2007). Rural financial market in Tanzania: An analysis of Access to financial services in Babati District, Manyara Region. PhD thesis, University of South Africa.
- Colombain, M. (1950). *Co-operative and Fundamental Education*. Paris: United Nations Educational, Scientific and Cultural Organisation 19 Avenue Kleber.

- Nyamsogoro, G. D. (2010). Financial sustainability of rural microfinance institutions (MFIs) in Tanzania. PhD thesis, University of Greenwich.
- Gujarati, D.N. (2004). Basic econometrics. Fourth edition, The McGraw–Hill Companies
- Kessy, S.S.A. and Urrio F. M. (2006). The contribution of Microfinance institutions to Poverty Reduction in Tanzania: *REPOA Research Report No. 06.3*.
- Kinde, B.A. (2012). Financial Sustainability of Microfinance Institutions (MFIs) in Ethiopia. *European journal of management. Vol. 4, no 15(2012)*.
- Lafourcade, A., Isern, J., Mwangi, P. and Brown, M. (April 2005). Overview of the outreach and financial performance of microfinance in institutions Africa. [www.griequity.com/resources/.../Africa\\_Data\\_Study.pdf](http://www.griequity.com/resources/.../Africa_Data_Study.pdf)
- Mataba, L. (2010). Sustainable Loan Interest Rates Setting in Saving and Credit Cooperative Societies: A Strategy Towards Building Viable Microfinance Institutions (MFIs). *MUCCoBS Research Report Series*, 3.
- Piprek, G. (2007). Linking with Saving and Credits Cooperative (SACCoS) to expand Financial Access in Rural Areas: A case study of CRDB Bank in Tanzania.
- Okumu, J.L. (2007). The microfinance in Uganda; sustainability outreach and regulation. PhD Desertation, University of Stellenbosch.
- Randhawa, B. and Gallardo, J. (2003). Microfinance in regulation in tanzania; Implication for development and performance of the industry. *Africa working paper series no.51*. <http://www.worldbank.org/afr/wps/wp51.pdf>
- Satta, T.A. (1999) Financial Sector Reforms and the Development of Financial Intermediaries in Tanzania: 1985-1997. *African Journal of Finance and Management Vol.7(2) 1999: 128-143*. <http://dx.doi.org/10.4314/ajfm.v7i2.24354>
- Temu, S.S. and Ishengoma, E.K. (2010). Financial linkages and performance of rural microfinance cooperatives: Tanzanian case. *Indian Journal of Economics and Business. Vol. 9 (2)*, pp 285-302.
- URT (2002). *Cooperative Development Policy of 2002*. United Republic of Tanzania.
- Wangwe, S. (2004). Innovation in Rural Finance in Tanzania. Paper prepared for The Third Annual Conference on Microfinance held from 15<sup>th</sup> to 17<sup>th</sup> March 2004 at the AICC, Arusha-Tanzania.

Table 1: Summary Independents Variables and Hypothesis

Explanatory variable	Breadth outreach (number of members of SACCoS)	Depth outreach (average loan/credit size)
	Hypothesis	Hypothesis
Year	+	+
SACCoS (SACC)	+	+
internal sources of funds (EQT) = (share, savings and deposits)	+	+
External Liabilities(LIB) = (Portfolio minus funds from internal sources)	+	+
Credit - asset ratio (CRAR)	+	+
External Liabilities (LER) = internal sources of funds ratio	+	+

“+” indicates that when independent variable increase also dependent variable increase (positive relationship between dependent and independent variables).

Table 2: Summary of Hausman fixed random test results

	Chi-square	Probability of chi-square	Decision
Model 1	11.81	0.0189	Do not reject H <sub>0</sub>
Model 2	2.65	0.6185	reject H <sub>0</sub>

For model 1, using probability of chi-square which is less than 5%, we do not reject null hypothesis that the two estimations are satisfactory in favor of random effects model, and in model using probability of chi-square which is greater than 5%, we reject null hypothesis that the two estimations are satisfactory in favor of fixed effects model.

Table 3: Summary of panel data regression results

	<i>Model 1</i>	<i>Model 2</i>
	<i>(Fixed effects)</i>	<i>(Random effects)</i>
	Dependent – number of SACCoS Members (MEMB)	Dependent – average loan/credit (AVC)
Intercept	-2580198**	-50.37405**
Year	1288.984*	0.252484**
Number of SACCoS (SACC)	88.35412*	-0.0009938*
Internal sources of funds	0.3554547*	0.0000162*
External sources of funds (LBL)	0.6087507*	0.00000296***
Gross loan portfolio-assets ratio (CRAR)	244.358*	-0.019929**
Liabilities/debt-equity ratio	-915.7357	0.1054568*
R <sup>2</sup>	0.7299	0.6477
Prob. F Statistics	0.0000	0.0000

\*, \*\*, \*\*\* indicate significant at one, five and ten percent significance level, respectively.

In column 2 the summary shows the test results of breadth outreach using fixed effects regression. The model is good since the variables fit the model. The amount of variability that can be explained in median value of owner-occupied homes by means of the model variables is 72% (within) while 28% is explained by other variables. All explanatory variables are significant except liabilities-equity ratio which was insignificant. Moreover all variables produced positive signs as were hypothesized except liabilities-equity ratio.



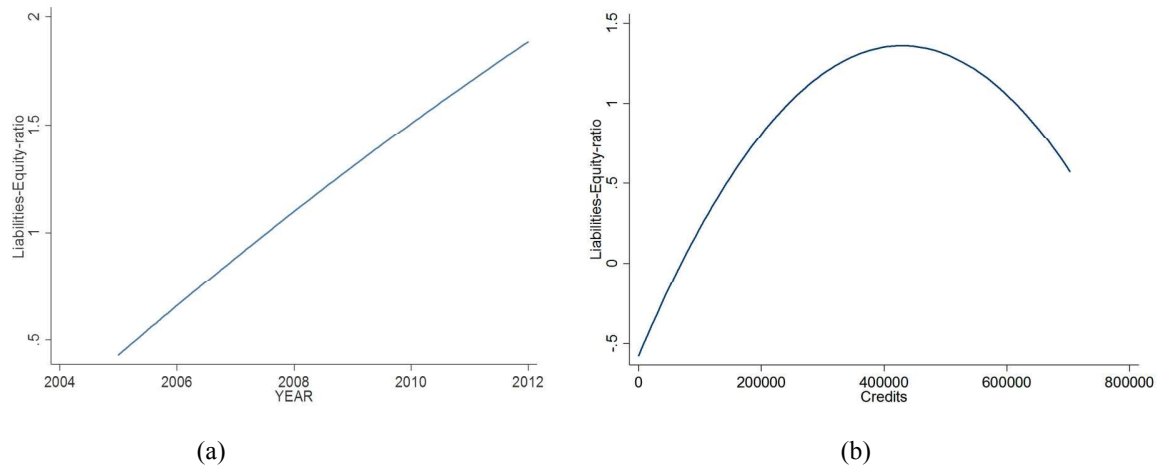


Figure 2: Role of external funds (external liabilities) to the loan portfolio

Figure 2 (a) show linear relationship between time and liabilities-equity ratio and 2(b) show that relationship between loan portfolio/credits and liabilities-equity ratio increases is positive to a certain limits.