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ERSA working paper 529

July 2015

Economic Research Southern Africa (ERSA) is a research programme funded by the National Treasury of South Africa.

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July 2, 2015

Abstract

This paper examined the profitability and financial sustainability of Saving and Credit Cooperatives (SACCOs) in Tanzania. The data set used in this study came from SACCOs' audited financial reports for the year 2011. Profitability was estimated using return on assets and financial sustainability was estimated using the ratio of total expenses to total revenue. Linear regression was used to investigate the determinants of financial sustainability. The results show that about 61% of our sample SACCOs are operationally sustainable and 51% of the total sample is both operationally and financially sustainable. The average sustainability score was 127%. On average, our results for profitability (measured by return on assets) are higher than some of the results reported for standard microfinance both in the region and globally. In terms of sustainability our results suggest a promising future for the financial cooperative business model as an alternative form of financing the poor. This study contributes in two ways. First it contributes towards the scanty empirical literature on the performance of saving and credit cooperatives in developing countries and Tanzania in particular. Second, it provides provocative evidences which appear to contradict earlier and more pessimistic accounts on members based microfinance. It challenges the existing ontology about the potential of extending member-based microfinance. We acknowledge that only SACCOs with audited financial statements were included in our study, thus the conclusion is limited to SACCOs with similar characteristics. Future work might consider extending the analysis to include SACCOs with non-audited financial statements.

Key Words: Saving and Credit Cooperatives, Microfinance, Sustainability, Tanzania

JEL: G21, G2, D31, D24, I30

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1 Introduction

The poor, who constitute the majority of the population in developing countries, are always excluded from mainstream banking. The financial exclusion in Sub-Saharan Africa by the classical banking system is about 88%, and for countries like Tanzania it is about 90% (CGAP 2013; Finscope, 2009). To bridge such a financing gap, microfinance has emerged as a powerful tool for poverty alleviation through increased financial access to the poor. While the surge of microfinance institutions (MFI) has been unprecedented in the past three decades, their performance and sustainability is still a contentious debate. Maybe the most authoritative statement during our time is that by Jonathan Morduch (2000) in his paper on microfinance where he argues that less than 1% of MFIs are sustainable and no more than 5% will ever be. While the statement was issued in the context of NGOs and donor-funded MFIs, it shed some light on the challenges facing the industry in general. However, the empirical research done by Gonzalez (2005) using Mix Market data shows that at least 50% of MFIs become sustainable after 5-10 years of operation. Based on this controversy in the literature, it is clear that more empirical work is needed to investigate the performance and sustainability of different microfinance schemes.

The current study uses field data from saving and credit cooperatives (SACCOs) from Tanzania to explore their profitability and sustainability and extend the existing empirical debate on the performance and sustainability of microfinance. SACCOs (credit unions) are special type of microfinance institutions which are governed by democratic principles: the members are the owners and users of the service. The interest in this group of microfinance is in fourfolds: first, the institutions have recorded explosive growth in the past 30 years which makes us wonder whether they are on the stairway to economic heaven or on the highway to financial crisis. In other words, is it a long-lived innovative growth in microfinance or a boom which is going to burst? Second, in the past the Tanzanian government exerted excessive political intervention in the cooperative movement which dwarfed their performance and led to the collapse of the sector (Maghimbi 2010; URT, 2002). However, since 1990s a new wave of cooperatives, including SACCOs which are less subject to political pressure and intervention, has emerged, but there is a dearth of empirical literature on their performance. Third, the unique ownership and governance structure based on social capital within SACCOs is likely to moderate the behavior of both borrowers and savers, which in turn may lead to a superior performance outcome compared to standard microfinance. Fourth, the empirical literature on the performance of financial cooperatives in Africa is scanty. Thus, the motive behind this study is to understand how SACCOs perform and whether they are sustainable. Understanding the performance and sustainability of these institutions is important for two reasons: it is a necessary condition for institutional longevity and lasting services to the poor, and it is an important barometer for researchers, policy-makers, regulators and shareholders in guiding the industry in the desired direction. Therefore the objective of this study is to estimate profitability and financial sustainability of SACCOs in Tanzania.

This paper is structured as follows. First it provides the context of the study focusing on the role of finance in economic growth and the existing credit market failure by conventional banking system. Next section presents both theoretical and empirical literature review on microfinance sustainability. The methodology is presented in section four followed by results and discussion in section five. The conclusion and recommendations is presented section six.

1.1 Context

It is acknowledged that access to finance plays a significant role in economic growth and development by efficiently channeling resources from the surplus unit to deficit units. More importantly, it plays a key role in the provision of the capital necessary for starting and expanding businesses, and innovating and reducing unnecessary transaction costs (King & Levine, 1993a,b; Arestis & Demetriades, 1997; Odedokun, 1998). Further, the literature shows that access to financial services can increase household welfare through increased ability to accumulate assets, unlocking their productivity potentials and increasing capability to deal with risks (Akpandjar et al., 2013; Dercon et al., 2006; Wangwe, 2004). Yet the majority of the economically active population is excluded from mainstream financial services in most developing countries. In Tanzania about 90% of the population is excluded from the mainstream banking sector (Finscope, 2009).

Such market failure in the mainstream financial institutions can be explained partly by credit rationing (Stiglitz & Weis, 1981; Luzzi & Webber, 2006; Mwaka-jumilo, 2011) and partly by inherently risky environments facing the poor. The major reasons for such exclusion advanced by mainstream financial institutions are high transaction cost per borrower, lack of collateral, information opacity, high risk of default, and low rate of cost recovery (Stiglitz & Weis, 1981; Beck et al., 2006; Mori et al., 2009; Beck, 2007; ACCA, 2009). As a result of such failure in financial markets there has been a financing void for the poor and their microenterprises in most developing countries.

In response to such financial market failure, microfinance institutions have emerged as an alternative solution by targeting the poor through innovative lending approaches, including group lending, progressive lending, regular repayment schedules, and collateral substitutes (Thapa, 2006). Tanzanian saving and credit cooperatives in particular have gained popularity recently as one of the fastest growing microfinance institutions. Despite the existing view that these institutions suffer from high transaction costs due to their small size and their exposure to relatively high risk clients, saving and credit cooperatives have recorded unprecedented growth during the past 30 years. Their growth in numbers has surged from 803 in 2000 to 5,400 during 2012, their membership increased by 584%, and savings increased by 1780% in the same period (BOT, 2013; MAFC, 2013). According to industry experts from Tanzania ministry of cooperatives, the growth is a mixture of organic growth and the increased supply of loanable funds targeting SACCOs by pension funds, commercial banks and government agencies. Such a high growth rate especially in last 10 years

calls for rigorous scrutiny of their performance and sustainability.

Saving and Credit Cooperatives are owned and operated by members based on democratic principles. A typical SACCOs in Tanzania has more than 20 members bonded together by community bond or occupational bond. The service is offered only to members who usually start by saving before they are qualified to borrow. The current industry consensus is that, a member is allowed to borrow up to three times of his/her total investments (through saving or/and shares) to the organization. Some SACCOs limits it to two times total investments. The main compositions of their funding are from members saving, members' equity and loans from other financial services and pension funds. The unique ownership and governance model of these institutions expose them to both unique opportunities and challenges.

The opportunities which come along with this type of business model includes information advantage and peer monitoring which help to mitigate the default risk. Also by the members being the active participant and owner of the organization the business is run like a family business which may lead to unique social structures which may have a positive impact on members' loyalty. On the other side, the key challenges are that growth of these institutions may be limited and jeopardizes the potential gains from the economies of scale. Also the small SACCOs may be limited in terms of the talent diversity and managerial capacity to properly run the business (McKillop & Wilson, 2011). Therefore the question whether SACCOs will be profitable and sustainable remains to be an empirical issues.

1.2 Literature review and theoretical framework

1.2.1 Objectives of financial cooperatives

Cooperative organizations are member-based organizations governed by democratic principles. The members decide on a voluntary basis to join the organization of their choice with common goals of achieving both economic and social objectives. Normally the members are owners and users of the services with a common bond such as associational, professional or residential (Fried et al., 1993). The implication of this model is that the objectives of a typical cooperative may not necessarily reflect the typical profit maximization objective under the neoclassical theory of the firm (Fried et al., 1993). Since these members are owners and users of the service sharing a common bond, it is likely that they know each other and operates based on trust and social capital: they treat the business as a family business which dampens the problem of information asymmetry and moral hazard. Thus it is expected that transaction costs of financial cooperatives would be lower than standard microfinance. Normally, the members of SACCOs can only borrow between two and three times their deposits, thus the loan offered is at least 33% secured which also reduces the credit risk significantly.

According to principle number 7 of the seven principles¹ guiding coopera-

¹The seven principles of cooperatives are : 1.Voluntary and Open Membership , 2. De-

tives, these institutions are supposed to offer sustainable development services for their communities through the policies approved by the members (CDA, 2014), thus they focus on both economic and social development. This unique business model of financial cooperatives comes with both opportunities and challenges. Opportunities emanate from the common bond and common goals through shared values, understanding and social capital which make the members feel like insiders of the organization. According to Akerlof and Kranton (2000) in their work on identity economics, when members of the organizations feel that they belong to an organization and own part of the organization, as “insiders” they behave differently compared to “outsiders”. Behavioural economics predicts that “insiders” are likely to go the extra mile to protect and patronize the interest of the organization (Akerlof and Kranton, 2000). Based on this prediction we expect that *ceteris paribus* the performance of SACCOs is likely to be superior to standard microfinance. However, SACCOs operate in an institutional context which is less favorable than standard MFIs in terms of size, client segments, transaction size, location, and managing system, which may impose extra costs and jeopardize performance and sustainability.

These organizational structures come with certain challenges, since they are joined by a common bond they may be excessively exposed to a systematic risk due to the homogeneity of the members. Also the common bond may be a stumbling block toward further growth and may negatively affect the gains from economies of scale and their ability to garner a significant talent pool for management and oversight of the institution.

1.2.2 Sustainability concepts

Sustainability is defined as the ability of an entity to continue a defined behavior indefinitely (Filene, 2011). In other words, it is the ability of an organization to meet its goals or target over the long term. In the context of financial institutions and for firms, this requires private profitability: a return on equity, net of subsidy that exceeds the private opportunity cost of resources (Schreiner & Yaron, 1999). Self-sustainability can be measured in terms of both financial and economic sustainability. Financial sustainability means the smooth operation of financial institutions with the necessary profitability, having adequate liquidity to overcome any challenges of bankruptcy. In other words, financial sustainability means that the SACCO is able to cover all its present costs and the costs incurred in growth, if it expands. Economic sustainability can be gauged from an easily quantifiable proxy of the impact on low income group financial intermediation in lieu of a full cost benefit analysis (Yaron et al., 1998).

The term sustainability has broader dimensions, including financial sustainability, institutional sustainability, mission sustainability, programme sustainability, human resource sustainability, market sustainability, legal policy envi-

mocratic Member Control, 3. Members’ Economic Participation, 4. Autonomy and Independence, 5. Education, Training and Information, 6. Cooperation among Cooperatives, 7. Concern for Community. See : <<<https://www.ncba.coop/7-cooperative-principles>>> for details on these principles.

ronment sustainability, and impact sustainability (Sa-Dhan, 2010). A concise and detailed explanation of these concepts is presented in Sa-Dhan (2010). Despite the importance of each component of sustainability, this study will focus on financial and operational sustainability of SACCOs due to data availability and the general understanding that financial sustainability can be a good indirect proxy of other sustainability measures, at least in the short run.

1.2.3 Sustainability of microfinance institutions

The contemporary debate on financial sustainability in microfinance institutions is dominated by the welfare and institutional schools of thought on whether it should be one of performance indicator or not. The welfare proponents argue that microfinance was established to reduce poverty through empowering the poorest of the economically active poor (Nyamsogoro, 2010; Brau & Woller, 2004), therefore their success should be measured based on the depth of their outreach (how many poor clients they are able to reach). Thus, the proponents of the welfare approach put less emphasis on the financial sustainability of microfinance institutions. They argue that if more emphasis is devoted to financial sustainability it may lead to a trade-off on depth of outreach by serving richer and less risky clients and charging high interest rates. They suggest that the social objective should be a priority and if there is a loss made during operation, the government, social investors and the donor community should balance it (Woller et al, 1999). Based on this thinking, the financial sustainability is not treated as a one of the major goal. The critics of the approach argue that donor funds are volatile and unsustainable and that ignoring financial sustainability may erode the quality of the revolving fund and jeopardize the future availability of the service. The implication is that if financial sustainability is not one of the major goals, microfinance institutions may collapse in the long run: as Schriener (2000:425) says, “unsustainable microfinance might help the poor now, but they will not help the poor in the future because they will be gone”.

Proponents of the institutional approach argue that the main objective of microfinance is to create sustainable financial intermediation for the poor. Their argument is founded on the understanding that sustainable microfinance will provide lasting services to the poor and deepen the financial system (Nyamsogoro, 2010; Brau and Woller, 2004; Woller et al., 1999). But the critics of this approach argue that emphasizing financial sustainability may lead to mission drift by microfinance moving away from the social objective of poverty reduction (Aubert et al., 2009; Copestake, 2007).

Despite the disagreement between the two views on the success indicators of microfinance, recent debates are oriented towards financial sustainability and commercial viability of microfinance institutions (Nyamsogoro, 2010; Schriener, 2000; Havers, 1996). The shift is driven by the fact that sustainable microfinance is able to attract funds from the markets, increase in size, enjoy economies of scale and widens their outreach. Also, if there is seed funding (initial capital) from donors and government initiatives, such seed can be guaranteed in terms

of its future ability to revolve and the longevity of the services offered. The shift is further buttressed by the empirical observation that most of the microfinance which was operating based on a welfare approach has been relatively underperforming (Nyamsogoro, 2010). This underperformance has led to some prominent microfinance institutions, such as Grameen Bank, coming up with the Grameen II innovation which is more institutionalism-oriented (Nyamsogoro, 2010). The current study is informed by the institutional view that microfinance needs to be commercially viable and financially sustainable or working towards that goal.

In terms of profitability of financial institutions different ratios may be used. The commonly used ratios are return on assets and return on equity (Nyamsogoro, 2010; Tucker & Miles, 2004). Due to data limitation, the current study uses return on assets as a measure of performance and profitability. Return on assets (ROA) measures the overall profitability and reflects both the profit margin and how efficiently the institution is using the total assets to generate revenue (Sa-Dhan, 2013; Brealey et al., 2006). ROA is calculated as the ratio of the net revenue to the total assets. We do acknowledge that using ROA as singular measure of profitability of social enterprises has its own limitation. Most of the social enterprises especially have double objective that is socio economic development of the community on one side and financial viability on the other side (URT, 2002; McKillop & Wilson, 2011; Rixon, 2013). Thus focusing on profitability dimension alone may lead to biased conclusion on the actual performance of these enterprises.

1.2.4 Empirical literature on financial sustainability and performance of microfinance

Despite the fast-growing trend of different variants of local microfinance, especially in Africa, there is little empirical literature on the sustainability of microfinance institutions. The available empirical work is limited to relatively large and/or international microfinance, where data is accessible from the online microfinance database (Mix Market).

The existing literature on the profitability and sustainability of microfinance offers mixed results. For example, findings from Namibia concluded that almost all microfinances are not sustainable (Adongo & Stork, 2005). A study on Nepal showed that most rural microfinance institutions are not sustainable (Acharya & Acharya, 2006). Using Mix dataset Thapa (2006) found that MFI in all the developing regions except Africa were sustainable. Further analysis by Thapa (2006) showed that MFIs from South East Asia are fairly sustainable while the South Asian MFIs are not. Nyamsogoro (2010) found that, of 424 observations, 80.2% of the rural microfinances in Tanzania were financially sustainable. Using data from 47 MFIs from Kenya and Tanzania, Mori and Olomi (2012) found that, the average sustainability of MFIs were 98% and concluded that on average these MFIs are working towards achieving the sustainability goal. Most of these studies use the data from large MFI reported in mix market. Our study extends this literature by adding empirical evidence on financial cooperatives which are not normally reported in major database like mix market and are less explored

in empirical studies.

Based on these results it appears that the microfinance sector in Tanzania is relatively promising. However the overall trend in empirical literature in Sub Saharan Africa has limited coverage of SACCOs. The current study will add to the limited empirical literature in this area by exploring the sustainability of saving and credit cooperatives. These institutions are unique in their structure, governance and ownership. Most of them are positioned towards the lower end of the financial system continuum which might exposes them to different operational challenges. For example most of them are quite small, servicing homogeneous clients with relatively high risk and low income compared to conventional financial institutions including larger MFIs. Such heterogeneity across financial service providers might limit the extent to which the empirical results might be compared across financial institutions. The plausible scenario will be to do comparative analysis of our results across similar studies using SACCOs. But due to limited empirical literature on SACCOs, intra-industry comparison is challenging. Hence most of the comparison will be across microfinance industry with acknowledgement of the potential heterogeneity across the industry.

1.2.5 The determinants of sustainability

Previous studies have broadly categorized the determinants of financial sustainability into institutional characteristics, agency cost, environmental/governance and business strategy (Aveh, 2013; Aveh, Krah & Dadzie, 2013a; Kinde, 2012; Nyamsogoro, 2010). Institutional characteristics include efficiency, capital structure, age, size, and interest rate charged. Agency cost includes sources of finance, subsidy dependence, branches, enforcement procedures, and lender-borrower relationship. Business strategy includes screening mechanism, group or individual collateral, dealing with default rates, and peer monitoring. Environmental and governance factors include geographical location, gender of the borrower, job creation, competition, quality of board of directors, quality of staff and regulatory framework (Aveh, Krah & Dadzie, 2013b; Kinde, 2012; Nyamsogoro, 2010; Woller, 2000; Gonzalez-Vega, 1998; CGAP, 1996).

More efficient financial institutions tend to have relative lower expenditure and higher revenue generated per unit. In other words, efficiency affects sustainability positively through two channels: cost reduction and revenue increase (Nyamsogoro, 2010). SACCOs with high leverage ratios are relatively less sustainable because of the increased cost of capital and the likelihood of ex-post moral hazard (Kinde, 2012; Bogan, 2012; Nyamsogoro, 2010). Age has been mentioned as an important factor because of the accrued incremental learning through trial and error in business, overhead costs, learning curve and relationship building. According to Gonzalez (2005), on average it takes about five years for at least 50% of microfinance to become sustainable (based on the Mix Market dataset).

The discourse on the impact of capital structure on firm's performance is contentious with two dominating extreme view. Modigliani Miller theory of capital structure asserts that there is no impact of debt or leverage effect on

form's value (Modigliani and Miller, 1958). On the other hand, the opponent of Modigliani theory argue that high level of leverage increases the cost of capital and expose the form into insolvency risk (Murray and Vidhan, 2007; Myers and Majluf, 1984; Jensen and Meckling, 1978). However recent empirical evidence in microfinance has demonstrated that capital structure has significant influence on sustainability of microfinance. Bogan (2012) argue that the life cycle theory which is the most popular explanation of the link between capital structure, sustainability, efficiency, and outreach fall short in telling the entire story with respect to MFI financing. Instead other economic and financial variables such as capital structure play an important role. Using panel data approach he concluded that there is causal evidence to support the assertion that the use of grants drives down operational self-sufficiency. Thus heavily reliance on grants and subsidy has adverse effect on sustainability of microfinance due to lack of competitive pressure in associated with attracting market funding.

Effective screening methods and rigid group collateral, including forcing the group to pay on behalf of the borrowers, has shown a positive impact in reducing moral hazard and improving the repayment rate (Richman & Fred, 2010). Some studies have shown that the gender of borrowers is important. Women are generally believed to have a higher repayment rate than men because of their skills in budgeting and handling household cash (D'Espallier et al., 2009). However some empirical studies from Ghana reported that men are less likely to default than women (Richman & Fred, 2010). Other factors, such as increased competition, group-based lending, high quality of staff members and board of directors, have also been documented to have a significant positive effect on financial sustainability (Aveh, 2013). Cost per loan portfolio has been reported to be an important factor. According to ACCION (2004) a cost per loan portfolio greater than 20% should be a matter of concern (Rai & Rai, 2012).

In summary, previous empirical and theoretical studies have suggested different sets of important determinants of financial sustainability for microfinance institutions. Different studies have used different variables depending on the research question(s) asked and the data availability. The current study uses return on assets, technical efficiency scores, loan size and deposit mobilization, and cost per loan portfolio as independent variables due to the data limitation.

1.3 Methodology

1.3.1 4.1 Data set

The study used secondary data from annual audited financial statements for 2011. The SACCOs included in the study were from four regions (Dar Es Salaam, Mwanza, Kilimanjaro and Arusha) which were selected based on the concentration of the total number of SACCOs with audited financial reports. The selection was guided by subject matter specialists from the Tanzania Co-operative Agency and the Cooperative Auditing and Supervisory Corporation (COASCO). Information from 139 SACCOs was collected but only 103 had complete information. Only SACCOs with complete information were used. The

key variables extracted from financial statements were: total cost in Tanzanian shillings (TZS), total fixed assets in TZS (a proxy for capital), total deposit in TZS, and total loan portfolio in TZS.

1.3.2 Estimation of sustainability

According to UNCDF (2002), institutional sustainability can be measured in terms of operational self-sufficiency (OSS) and financial self-sufficiency (FSS). OSS measures the extent to which the institution is able to cover its operating expenses with its operating income, and FSS measures the extent to which operating profits cover an institution's costs. When calculating OSS the expenses include all cash and non-cash expenses from the income statement, such as depreciation and loan loss provision expenses, as well as any cash costs of funds, such as interest and fees paid on debts or to savers with voluntary deposits (UNCDF, 2002). For comparative purposes a different version of OSS, which excludes the cash cost of funds from total operating expenses, may be preferred. The latter approach mitigates the penalty imposed on an institution by the first formulation due to the differential access to commercial financial markets and interest structure.

$$OSS = \frac{Total\ Revenues}{Total\ Expenses} \quad (1)$$

FSS is given as the ratio of adjusted operating income and adjusted operating expenses. The adjustment is crucial to show how the financial picture of an institution would look on an unsubsidized basis, where funds would be raised on the commercial market, rather than through donor grants or subsidized capital. Customer deposits and debt must also be adjusted to reflect market rates on loans and deposits. Since the inflation rate erodes the value of equity, financial equity balances must be adjusted to account for inflation. Other income, such as subsidies and in-kind cash, is also adjusted. FSS is computed as follows:

$$FSS = \frac{Adjusted\ Operating\ Revenues}{Adjusted\ Operating\ Expenses} \quad (2)$$

Given the volatility of inflation in Tanzania, which is almost always in two digits, the current study used unadjusted financial self-sufficiency but took loan loss provision into account. Since our data does not include loan loss provision, a conservative value of 5% of the total loan portfolio is used as the rate of loss provision. The 5% loan loss was selected based on discussion with subject matter specialist from Tanzania cooperative auditing and supervisory committee. The figure is close to the industry average in microfinance as reported in micro-rate².

A regression model is used to explore the impact of efficiency scores, return on assets, deposit mobilization and loan size on financial sustainability. Other key variables, such as age, governance, interest rate charged and others (see section 3.5) could play a significant role but were not included due to data limitation. Efficiency scores are borrowed from the recent paper using the same

²Performance Indicators for Microfinance Institutions by Micro Rate
http://media.microfinancelessons.com/resources/tech_guide_IADB_portfolio_quality.pdf

sample by Marwa and Aziakpono (2014). In summary, the technical efficiency which is a measure of the effectiveness of transformation of inputs into outputs was estimated using data envelopment analysis (DEA)³. Since technical efficiency is the product of the two and provides more comprehensive measure of efficiency, it will be used a proxy for efficiency measure in this paper. The remaining variables are defined in Table 1.

Following Nyamsogoro 2010 who investigated financial sustainability of rural microfinance in Tanzania, the current study uses linear regression model which follows the general form below:

$$Y = \beta X + \varepsilon \quad (3)$$

where Y represents financial sustainability scores, B is a vector of regression parameters, X is a vector of control variables, and ε is the error term. The estimation was done sequentially. In the first step, a bivariate regression was fitted by regressing financial sustainability scores against each of the following: return on assets, technical efficiency scores, loan size and deposit mobilization, and cost per loan portfolio. Loans were transformed into logarithmic scale because of the difference scale. It was not possible to do log transformation of RoA because of the existence of negative values.

The Shapiro Wilk test and residual plots were used to check for normality assumption. Studentized residual was used to check for outlying observations. As rule of thumb, any residual with a value higher than two was further investigated using Cook's distance to check the overall influence on regression results. A cutoff point of $4/n$ was used for Cook's distance to eliminate influential observations. Five observations were eliminated because they were found to exhibit extreme values with a significant influence on the regression results. Therefore 98 observations out of 103 observations were used for the final regression analysis. The variance inflation factor (VIF) test was used to check for the presence of multi-collinearity. All the VIF values were less than 2, which is far less than the standard cut-off of 10. IMTET, developed by Cameroon and Trivedi (2009), was used to check for normality and homogeneity of variance. While the normality assumptions were violated, the histogram plot for residual seems well-behaved, which implies that the deviation is not far from normal and may be a problem of small sample size. We used robust standard error to take the problem of heteroscedasticity into account. The test for omitted variable was significant, implying that there are some important variable(s) missing in our model. One possible solution is to use instrumental variable regression. As we could not get the appropriate instruments to control for this problem, we plan to collect more variables to solve the problem.

Table 1 demonstrates the variables used in the current study, their definitions and measurements and their apriori expectations based on theory and previous

³Both constant returns to scale and variable returns to scale were employed to estimate the technical and pure technical scale efficiencies respectively. Following input oriented DEA and intermediation approach (deposit, total cost and total fixed assets) were treated as inputs and (total loan and total revenue) were treated as outputs. More details and theoretical debate around this is presented in Marwa and Aziakpono (2014).

empirical evidence.

1.4 Results and Discussion

Table 2 presents the key descriptive statistic for return on assets, financial sustainability, technical efficiency and deposit mobilization. The first half of the table shows the entire dataset and the second half of the table presents the results for 98 observations (after excluding the outlying observations). On average the return on assets ranges between -1.79 to 0.86 and -0.18 to 0.86, with and without outlying observations respectively, and the average return on assets is 6% and 7% respectively. Generally the return on assets reported here is almost twice the figure reported by Nyamsogoro (2010) for rural-based microfinance in Tanzania. The difference might be explained by the fact that majority of SACCOs included in our study (the one with audited financial statements) are urban based. Given the heterogeneity in institutional thickness and support system between rural and urban SACCOs, the later might enjoy reduced transaction cost and superior support system.

According to ACCION (2004) the optimal range for return on assets in microfinance is 3% and above. Based on this benchmark, on average SACCOs included in our study are doing well in terms of profitability. The mean financial sustainability is 133% and 127% respectively. Compared to the recommended minimum threshold (100%), our results indicate that on average the SACCOs included in the study are sustainable. However, the findings are slightly lower than those reported by Nyamsogoro (2010) for rural microfinance in Tanzania where he found an average financial sustainability of 156%. The average technical efficiency and deposit mobilization after excluding extreme values are 41% and 79% respectively. This implies that on average many SACCOs are relatively less efficient and about 21% of their funding is financed from external sources. It is important to note as mentioned earlier that our sample data may suffer from self-selection bias. This is because only SACCOs with audited financial statement were included in the study. They may have submitted their records for auditing because of current or future expectation for seeking external funding.

The summary statistics indicated that lowest quartiles (bottom 25%) had an average of 26% in deposit mobilization, implying that about 74% of their loan is externally funded, whereas the subsequent average deposit mobilization were 60%, 81% and 114% for the second, third and fourth quartile respectively. Deposit mobilization for the top 25% was 114%, and 60% and 81% for the middle lower and middle upper 25% SACCOs respectively. When compared with loan size larger SACCOs had lowest deposit mobilization compared to small ones. Such a low rate of deposit mobilization for the lowest 25% should be a concern as a high level of leverage may lead expose make these institutions to systemic risk.

About 84% of SACCOs had an operation cost to loan portfolio less than 20% which is the recommended threshold according to international best practices (ACCION, 2004). When financial sustainability scores are plotted against loan size (as proxy of firm size) as demonstrated in figure 1, financial sustainability

seems to exhibit a non-linear relationship. Firms whose loan size was about 1.8 billion and 4.7 billion had the highest sustainability scores among their peers. Smallest firms and largest firms had lower scores of financial sustainability. The practical implication of observed behavior is puzzling, and more qualitative research may be useful to understand the dynamics of this behavior. The results from the box plot show that, there are more variations in financial sustainability in smaller SACCOs (Quartile 1) than medium and larger SACCOs. The SACCOs with loan size in the range of quartiles 2-4 seems to have less variation in their financial sustainability scores. However on the median sustainability scores average seems to be similar across SACCOs of different sizes.

It appears that financial sustainability has a positive relationship with return on assets. SACCOs with a negative return on assets showed quite low financial sustainability scores, which suggests that their performance is quite low as they are not able to produce enough profit to cover their costs. They are generally performing poorly, hence they cannot cover their operation costs and their efficiency in transforming inputs at their disposal to outputs is relatively low. It might be that these organizations are relatively new to the business and they are trying to find their way. Also it may be that these SACCOs have invested excessively in long-term investments such as real estate which may take longer to realize returns on investment. It is important to note that once return on assets approaches a positive territory, the corresponding values of financial sustainability scores increase sharply, with a turning point around 4.7% (indicated by the red line in Figure 2). As observed in the distribution of financial sustainability, the return on assets across quartiles seems to have similar patterns. The smaller SACCOs have a higher level of variation of return on assets than larger SACCOs.

Table 3 presents the results of five different bivariate regressions. Based on the bivariate regression results for each independent variable against financial sustainability, the findings show that return on assets, technical efficiency, deposit mobilization, cost per loan and loan size had a statistically significant positive influence on the sustainability of SACCOs. Return on assets is the single most important variable, explaining about 77% of the variation in financial sustainability alone. Based on R^2 , technical efficiency and cost per loan are also important variables. These three variables had relatively high R^2 compared to others: 77%, 19% and 10% respectively. The magnitudes of their regression parameters are relatively large compared to other parameters. Return on assets and technical efficiency have a positive sign, implying that they have a positive influence, as would be expected in theory. Cost per loan portfolio has a negative sign as predicted by theory. The implication of these results is that in order for the firms to improve their financial sustainability they must reduce their cost per loan and increase their net income. These results are in line with the theory and support the findings from Nyamsogoro (2010) and Kinde (2012).

Table 4 shows the multiple regression results for the factors explaining financial sustainability of SACCOs. The variables included in the models explain about 80% of the total variation of financial sustainability scores, which is a reasonably good fit. After controlling for deposit mobilization, technical efficiency

and cost per loan, the results still show that return on assets is consistently the most significant factor determining financial sustainability. The influence of technical efficiency becomes insignificant under multiple regressions. This can be partly explained by the relationship between return on assets and efficiency, which means that firms with a higher return on assets are more likely to be efficient as indicated by the significant positive association between the two variables (see Table A1 in appendix for more details).

Surprisingly, deposit mobilization influences financial sustainability scores negatively. In theory it would be expected that high deposit mobilization would lead to lower cost of capital and hence a high level of financial sustainability, but the empirical evidence suggests otherwise. The observed discrepancy may be explained by the possibility that SACCOs with high deposit mobilization might be situated in the areas where there is a low level of institutional thickness, adverse operating environment and low linkages with other financial institutions which might lead to high transaction cost. A detailed qualitative follow-up may be necessary to understand the key drivers of the observed behavior. As expected, higher cost per loan portfolio has a negative influence on financial sustainability. It is important that the SACCOs whose cost per loan portfolio is above 20% should design innovative solutions to cut costs based on their operating environment.

It is important to note that some important control variables, such as age and interest rate charged, are missing, and this may lead to omitted variable bias. The empirical test for omitted variable bias was significant at 5%, which implies that our parameter estimates should be interpreted with caution. Previous studies have shown that younger microfinance operations are less sustainable than those which have been in operation for longer. Based on the mix market data, this time is estimated to be between 5-10 years. It is important to have a follow-up study which includes more variables such as age, geographical location, business model, and portfolio at risk (> 30 days).

1.5 Conclusion

Microfinance, including saving and credit cooperatives, plays a significant role in mitigating the credit market failure by providing financial services to the poor and low income earners. However, offering such a service to the poor is associated with high transaction costs, relatively high risk and a low rate of return. Based on these challenges it is imperative to investigate and monitor the financial sustainability of these institutions. In an effort to contribute to the current debates on sustainability of microfinance, this study investigated the financial sustainability of the fast-growing saving and credit cooperatives in Tanzania. Understanding the performance and sustainability of these institutions is important for two reasons: it is a necessary condition for institutional longevity and lasting services to the poor, and it is an important barometer for researchers, policy-makers, regulators and shareholders in guiding the industry in the desired direction.

Based on our sample, the findings show that average return on assets is 7%

and average financial sustainability is 127%. Overall the performance is satisfactory compared to international standards. The optimal return on assets for microfinance based on international best practice is 3% and above, the recommended operational sustainability is 100% and the recommended financial sustainability is 110%. In both measures, our samples SACCOs are doing relatively well. Based on our data, the key determinants of financial sustainability are return on assets, deposit mobilization and cost per loan portfolio. Of 103 SACCOs included in the study 61% were operationally sustainable and only 51% were both operationally and financially sustainable. Our results demonstrate that the financial cooperative model may yield better results than standard microfinance.

Our findings raise a significant question that is “why has an apparently enfeebled co-operatively organized MFI system in Tanzania shown such an apparent turnaround, given the deeply questioning findings reported in previous empirical works? This question set a stage for further investigation. It could be explained that there is a new emerging localized social structures within the SACCOs and between SACCOs and other institutions which has led to positive growth and performance spin on the industry. The recent growth trend in of SACCOs is clear demonstration of such behavior from the individual members (micro perspectives). But also the increased appetite of commercial banks (both local and international) and pension funding in extending wholesale lending to this institution may be a possible explanation. Thus, the recent trend in increasing institutional thickness both in formal and semi-formal financial system might have impacted on significance alliances both intra and inter industry. To have a better understanding of the interplay between the institutional thickness and inter-organizational network on the observed performance might be interesting topic for future research.

It is important to acknowledge that, the sample used in this study may lead to upward bias in the estimation because only audited SACCOs were included. Future studies may wish to include non-audited SACCOs and data on other key variables such as age, portfolio at risk and geographical location⁴.

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⁴We acknowledge the financial support provided by Research on Poverty Alleviation (RE-POA) which funded 75% of research cost and African Economic Research Consortium (AERC) which funded 20% of research cost and Economic Research South Africa (ERSA) which provided 1% funding to facilitate publication.

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Table 1: Summary of the variables

Variable Name	Definition/measurement	Variable Code	Expected effect of FSS
Financial Sustainability	Total Financial Revenue	FSS	NA
Technical Efficiency	Total expenses + Loan Loss Provision	TE	+
Return on Assets	Relative efficiency scores computed using data envelopment analysis*		
	Net Income	RoA	+
	Total Asset		
Size	Total loan portfolio	Size	+
Deposit Mobilization	Total Deposit	Deposit	+
	Total loan portfolio		

* For details see Marwa and Aziakpono (2015)

Table 2: Descriptive Statistics

103 Observations					98 Observations (Excluding Outliers)				
Variable	Mean	Std. Dev.	Min	Max	Variable	Mean	Std. Dev.	Min	Max
RoA	0.06	0.23	-1.79	0.86	RoA	0.07	0.11	-0.18	0.86
FSS	1.33	1.12	0.02	9.77	FSS	1.27	0.74	0.03	5.14
TE	0.42	0.28	0.00	1	TE	0.41	0.27	0.09	1.00
DM	1.23	4.50	0.02	45.71	DM	0.79	0.81	0.02	7.51

Note: RoA: Return on Assets
FSS: Financial Sustainability Score
TE: Technical Efficiency
DM: Deposit mobilization

Table 3: Bivariate Regression Analysis Results on Financial Sustainability **

	Financial Sustainability	Financial Sustainability	Financial Sustainability	Financial Sustainability	Financial Sustainability
Return on Asset	5.73 (18)				
Deposit Mobilization		0.20(2.21)			
Technical Efficiency			1.19(4.68)		
Log(Loans)				-0.08(-2.03)	
Cost per loan					-0.10(-3.27)
Intercept	0.88(20.72)	1.11(10.75)	0.78(6.20)	2.86(3.64)	1.37(17.75)
N	98	98	98	98	98
R Square	0.77	0.05	0.19	0.04	0.10

** Regression parameters with t statistics in the brackets

Table 4: Multiple Regression Analysis Results on Financial Sustainability

FSS	Coef.	Robust		P>t	[95% CI]	
		Std. Err.	t			
Return on Asset	5.86	0.61	9.63	0.00	4.65	7.06
Deposit Mobilization	-0.13	0.04	-3.36	0.00	-0.20	-0.05
Technical Efficiency	0.18	0.17	1.04	0.30	-0.16	0.52
Cost per unit loan	-0.02	0.01	-2.32	0.02	-0.03	0.00
Constant	0.91	0.06	14.9	0.00	0.79	1.03

Figure 1: Left-hand panel: Financial sustainability and loan size Right hand panel: Box plot for financial sustainability by loan quartiles

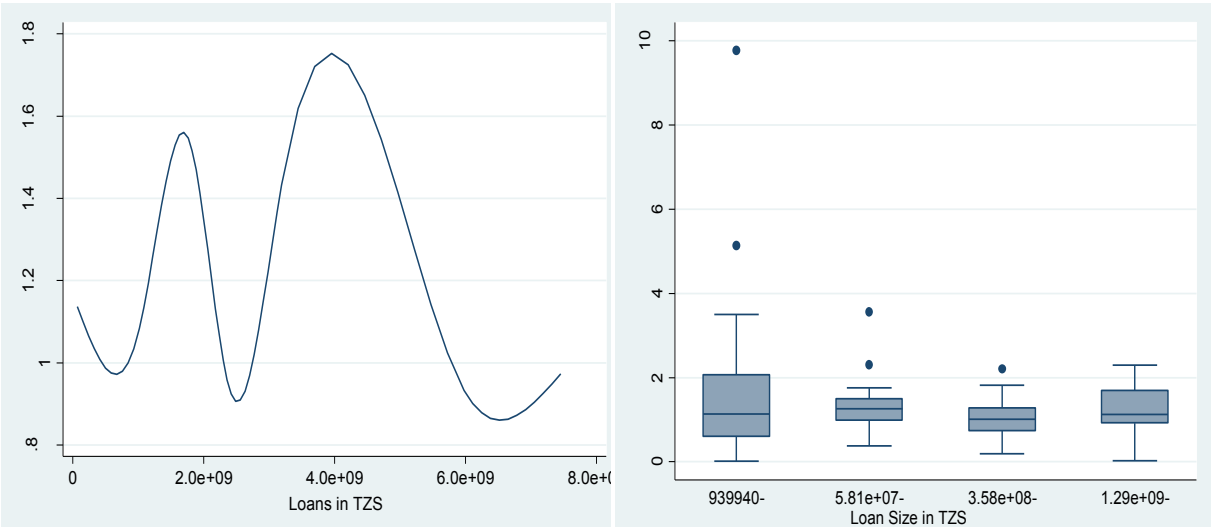
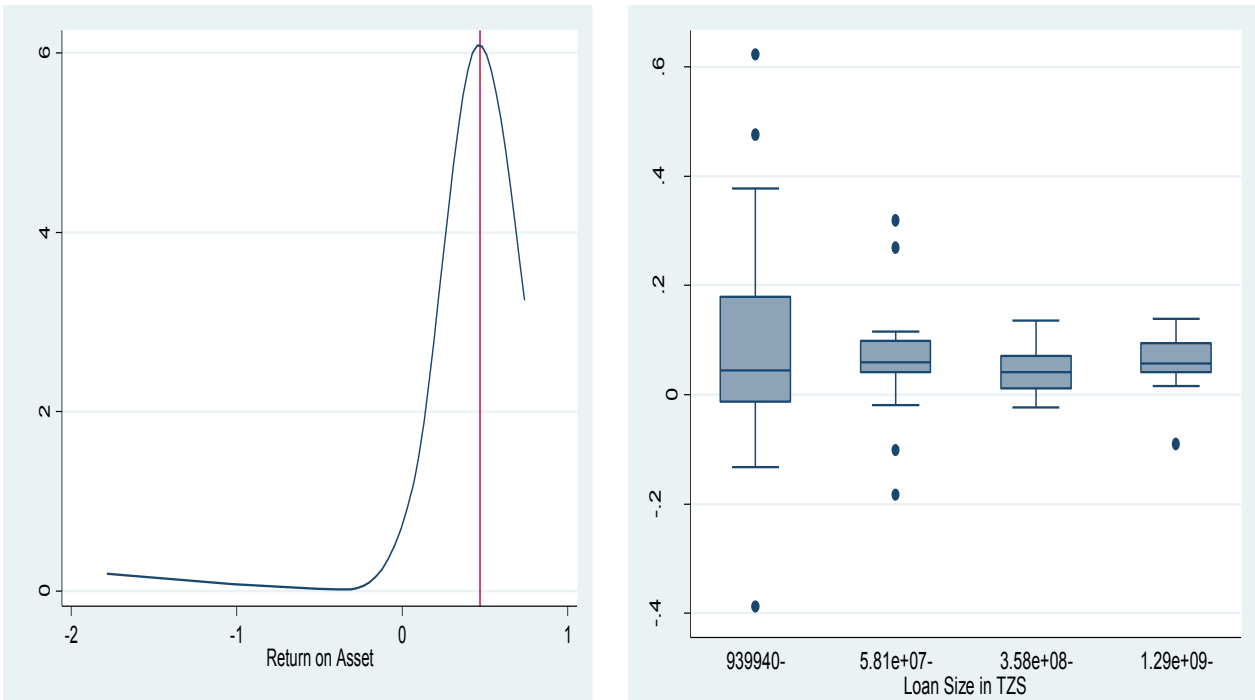


Figure 2: Left hand panel: Financial sustainability and return on assets Right hand panel: Box plot for return on assets by loan quartiles



Appendix

Table A1: Correlation Analysis

	FSS	RoA	DM	TE	CPL
FSS	1				
RoA	0.51*	1			
DM	-0.08	-0.15	1		
TE	0.44*	0.29*	-0.18	1	
CPL	-0.136	-0.39*	0.92*	-0.13	1

Note: FSS: Financial Sustainability score
 RoA: Return on Asset
 DM: Deposit Mobilization
 TE: Technical Efficiency
 CPS: cost per loan portfolio