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Effect of Outreach on Financial Sustainability and Profitability of Saving and Credit Cooperatives in Eastern Ethiopia

Abstract. This study scrutinized the effect of outreach on financial sustainability and profitability of SACCOs in Eastern Ethiopia using balanced panel data from 33 SACCOs over the period of 2017-2019. Quantitative approach and explanatory design were employed to realize the stated objective. This study used secondary data sources, mainly audited financial statement of the SACCOs, in the study period. The analysis revealed that SACCOs in Eastern Ethiopia are profitable but not financially sustainable. Random effect model results show that gross loan to asset ratio, yield on gross loan portfolio, managerial and operational efficiency has statistically significant and positive effect on the financial sustainability of SACCOs, while average loan size has statistically significant but negative effect. Likewise, gross loan to asset ratio, managerial efficiency, and average loan size has statistically significant and positive effect on the profitability of SACCOs in Eastern Ethiopia. However, the portion of women borrowers and number of active borrowers has statistically significant but negative effect on the profitability of the SACCOs in the study area. Finally, the study suggests that increasing the number of borrowing clients and sales volume (loan portfolio) could benefit SACCOs in Eastern Ethiopia from economics of scale.

Key words: Eastern Ethiopia; Financial sustainability; Outreach; Profitability; SACCOs

JEL Classification: M40

Introduction

Access to safe and affordable financial services is recognized as a prerequisite for equitable socio-economic growth of a country. Continuous and sustained availability of finance at an affordable rate equips the poor and vulnerable groups with access to productive resources (physical as well as financial), and helps in smoothening consumption and setting up their business enterprises (Vijeta and Puja, 2019). However, conventional approaches to facilitate access to finance for the poor and vulnerable groups have not met with success and they have failed to address the constraints in connection to finance.

According to Mori *et al.* (2009) the most important reasons for such exclusion by financial institutions is the presence of high transaction cost per borrower, lack of sufficient collateral to a secure loan, information opacity, higher risk of default and low rate of cost recovery. As a result, the mainstream financial institutions commonly failed in financing and providing services tailored to the poor and microenterprises in most developing nations, including Ethiopia.

In recent years, microfinance has emerged as an important tool to facilitate financial inclusion and has received attention from various socio-economic experts, policymakers and institutions (Vijeta and Puja, 2019; Chiu, 2014; Tavanti, 2013 and Bruton *et al.*, 2011). The cooperative movement has been regarded as being one of the financial mechanisms that can be used to improve financial accessibility for low-income entrepreneurs. In Ethiopia the

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delivery of financial products and services through micro-finance institutions like Saving and Credit Cooperative Societies (SACCOs) is one of the policy instruments used to enable rural and urban poor households and small enterprises to access deposit and credit facilities, which could improve productivity and increase income, thereby helping them to reduce poverty and attain food security (Muluneh, 2012 and Amha, 2002). The authors argued that this could not be achieved by the banking system.

SACCOs are pro-poor financial cooperative institutions designed for everyday people, in order for them to have their own efficient financial service-giving institutions based on the philosophy of building a self-help society, or "people helping people", to empower themselves in asset building by teaching thrift culture and making credit easily accessible – sustainably (Nalusiba, 2019; Henock, 2019 and Getachew, 2006). The main target of SACCO is to mobilize savings from middle- and low-income groups and avail credit to the members at relatively lower interest rates compared to other financial institutions (Karimi, 2011). Additionally, SACCOs reach clients in rural and or poor areas, which do not have access to both private and government owned banks. This makes them more attractive to customers since they largely demonstrate that the poor can borrow, pay substantial interest rates and save continuously in developing economies (Osoti, 2014 and Abate *et al.*, 2013).

One of the strong comparative advantages of SACCOs is their ability to reach large numbers of people who are overlooked by formal financial institutions, mainly banks. The contributing fact to the potential advantage from SACCOs is their ability to collect deposits from members and provide them with diversified loans (Henock, 2019 and Frank *et al.*, 2015). Members are required to save regularly and encouraged to borrow for productive purposes out of the accumulated savings. Since both borrowers and depositors are members of SACCOs, they are actively involved in creating and managing the demand and supply of loans (Henock, 2019).

So as mentioned by Relampagos *et al.* (1990) and cited by Nigusie (2015), in terms of outreach, SACCOs are better than other formal financial institutions. Currently, there are 18,959 primary level SACCOs in Ethiopia, out of which 14,976 have been established in rural areas and 3,983 are in urban areas with a membership of 3,430,655 people out of which 1,358,119 are female and 2,072,536 are male members, having 3.29 and 7.91 Billion birr in capital and savings, respectively (FCA, 2017). This quantitative increment in number, membership, savings and loan disbursement calls for rigorous investigation of how outreach affects the financial sustainability and profitability of SACCOs. SACCOs should be financially sustainable and profitable in order to provide sustainable financial services and contribute to poverty reduction.

Outreach is an indication of how SACCOs penetrate and provide quality financial services, as well as the volume of activities in the designated target society (Lafourcade *et al.* 2005). Okumu (2007) described outreach as efforts to extend SACCO services to the people who are underserved by other financial institutions, mainly banks. Outreach mainly incorporates breadth and depth dimensions, where breadth can be explained as the number of clients served and the volume of services delivered, while depth implies the socio-economic level of the clients that financial cooperatives reached (Okumu, 2007). Basically, increasing client outreach widens the financial services that are available to the cooperative members. Sustainability is the ability of a SACCO to cover its operating and other costs from generated revenue and provide for profit. It is an indicator showing how the SACCOs stay financially viable even if subsidies and financial aids are cut off (Woolcock, 2006). In other words, it is the ability of an organization to meet its goals or target in the long run (Filene,

2011). The financial performance of SACCOs is an important indicator since it shows the sustainability of current outreach and the potential for additional outreach (Ssebaale, 2011 and Turto, 2008).

Theoretically, outreach to the poor and financial sustainability can be potentially either complementary or conflicting (Quayes, 2012). Once the institution becomes financially sustainable, it can attain wider outreach today, tomorrow and in the future (Frank *et al.*, 2008). Meyer (2002) also noted that outreach and financial sustainability are complementary since the number of clients increases, and microfinance institutions (MFIs) enjoy economies of scale and reduce production costs, which helps them to become financially sustainable. On the other hand, Hulme and Mosely (1996), as cited by Abinet (2015), argued that there is an inverse relationship between outreach and financial sustainability. They argued that higher outreach means higher transaction cost in order to get information about creditworthiness of clients and hence makes MFIs financially unsustainable.

Evidenced from Southern Tigrai of Ethiopia, Sebhatu (2011) concluded that there is a substantial growth in outreach and improvement of operational self-sufficiency of SACCOs. Toli (2013) examined SACCO financial services in Addis Ababa and indicated that their outreach shows an increasing trend. Henock (2019) also examined the sustainability and outreach performance of SACCOs in Eastern Ethiopia for the year 2016 and conclude that they are financially sustainable and their outreach performance is at moderate level. Based on the simple correlation result of his study, the outreach performance shows a negative and insignificant association with financial self-sufficiency.

Saxena and Guntram (2018) reviewed financial performance of SACCOs in Tanzania through their outreach and financial sustainability, and the results of the study revealed that performance of SACCOs is good in terms of breadth outreach as it is reaching many rural dwellers and the sustainability indexes show a positive trend approaching to1,implying that the SACCOs moved towards gaining sustainability in financial intermediation. Joseph (2013) examined sustainability of rural SACCOs in Tanzania, and revealed that 46% of them, especially in Eastern and Central zone, were not sustainable because they accumulated large amount of nonperforming loan (NPL) and they did not issue new loans from 2006-2013. On the other hand, grants to total loans, cost per borrower, NPL to equity influenced the sustainability of rural SACCOs negatively while average loan size and age of SACCOs influenced sustainability positively. Nalusiba (2019) also investigated the relationship between outreach and sustainability of SACCOs in Uganda and revealed that sustainability is influenced by the number of borrowers, since it provides more interest to the SACCOs. This can then increase profitability and boost sustainability in the long run, which results into a positive correlation between outreach and sustainability.

Various studies are also conducted on the relationship between outreach and financial sustainability of Microfinance Institutions (MFIs). For instance, Abinet (2015) scrutinized the relationship between outreach and financial sustainability of MFIs in Ethiopia. He found significant and positive relationship between breadth of outreach, measured as number of active borrowers and gross loan to asset ratio, and financial sustainability and tradeoff between depth of outreach and financial sustainability. As per the findings of Befekadu (2007) on outreach and financial performance, MFIs are operationally sustainable measured in terms of return on asset and equity and the industry's profit performance is improving overtime.

Woller and Schreiner (2002) studied the relationship between depth of outreach and financial self-sustainability and found positive causation. Paxton (2002) examined the

relationship between depth of outreach and financial sustainability of MFIs (in Africa and Latin America) and found strong correlation between outreach and financial sustainability in Latin America and weak correlation in Africa. Cull *et al.* (2007),based on a cross-sectional study on MFIs in 49 countries, concluded that there is possibility of increasing yield while serving economically active poor and thereby meeting both the social mission and viability.

The most comprehensive study of sustainability (measured by cost efficiency) and depth of outreach (measured by the average loan balance and percentage of women borrowers) trade-off is by Hermes (2011) using data from 435 MFIs for the period 1997-2007. It concluded that outreach is negatively related to sustainability. The Olivares-Polanco (2005) study also confirms the existence of this trade-off. However these findings are inconsistent with Ayayi and Sene (2010), who show that outreach and the percentage of women among the clientele do not significantly influence MFI financial sustainability. Their findings corroborated with Cull *et al.* (2007), who show that MFIs can expand outreach without compromising financial sustainability.

Okumu (2007) examined the determinants of sustainability and outreach of MFIs in Uganda and indicated that sustainability is negatively and significantly related to the ratio of gross loan outstanding portfolio to total assets. However, Tilahun (2013) reported that financial sustainability is positively and significantly influenced by the ratio of gross loan portfolio to total asset in east Africa. Quayes (2012) studied the depth of outreach and financial sustainability of MFIs (from Mix market) operating in 83 countries and found a positive complementary relationship between financial sustainability and depth of outreach. However, Cheminingwa (2013) found depth of outreach was negative and significantly correlated with financial sustainability. On the other hand, breadth of outreach (numbers of borrowers) was found to be insignificantly related with financial sustainability in Kenya.

The literature reviewed so far reveal that studies conducted in Ethiopia have been focused on the management, trends and determinates of SACCOs from the perspective of outreach and sustainability (Sebhatu, 2011; Toli, 2013 and Henock, 2019). To the best knowledge of the researcher, the effect of outreach on financial sustainability and profitability of SACCOs is not yet studied in Ethiopia. However, there are various studies carried out on the relationship between outreach and sustainability of MFIs in and outside Ethiopia, even though their findings are contradictory (Abinet, 2015; Hermes, 2011; Cull *et al.*, 2007; Olivares-Polanco, 2005; Woller and Schreiner, 2002 and Paxton, 2002).They cover an ongoing debate between breadth and depth of outreach for financial viability and sustainability. Therefore, this study seeks to add evidence to the limited empirical studies in the context of Ethiopia by investigating the effect of breadth, cost and depth of outreach and managerial and operational efficiency (control variables) on sustainability and profitability of SACCO's in Eastern Ethiopia.
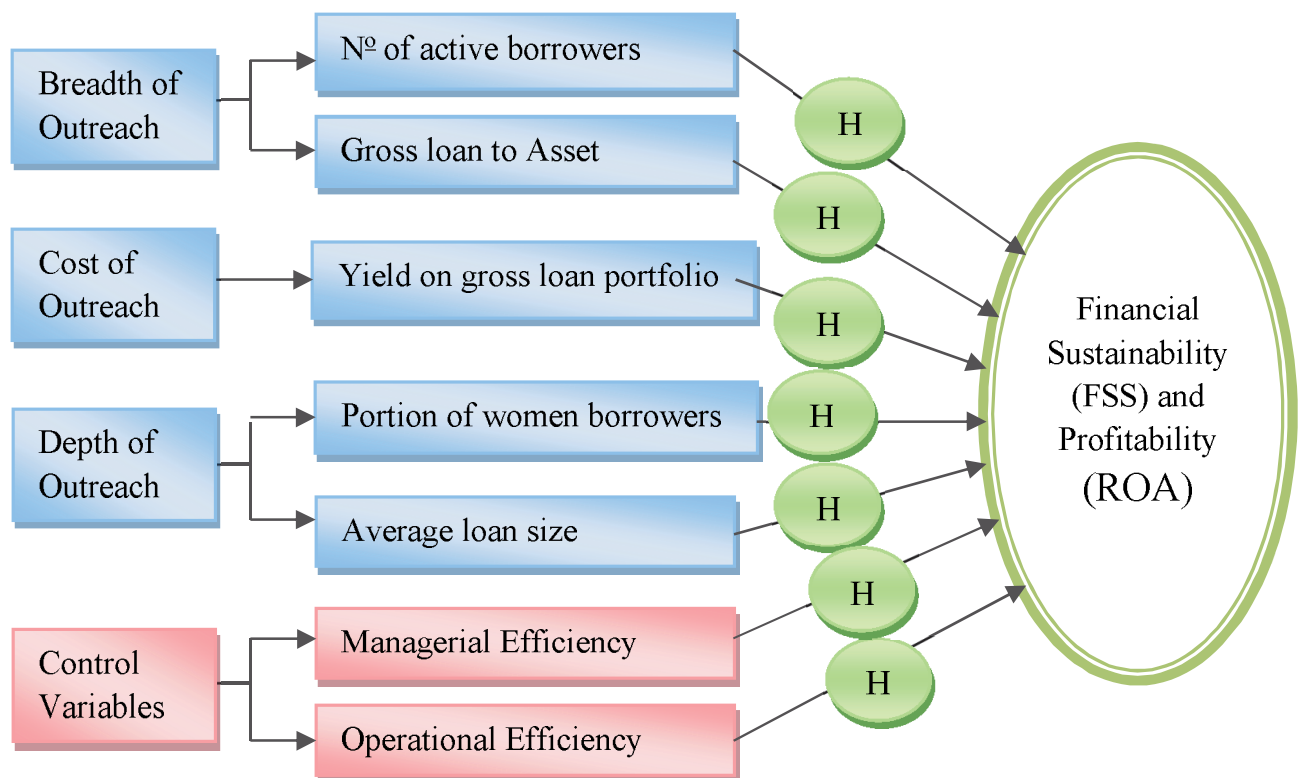
Figure 1. Theoretical model on the effect outreach on financial sustainability and profitability.

Source: Developed by author based on literature and Abinet (2015).

According to USAID (2006) and Schreiner (2002), there are six aspects of outreach framework: the breadth, depth, length, scope, cost and worth. However, some of these outreach factors may be difficult to measure since they require data that may not be easily available. Thus, this study examined only the effect of breadth, cost and depth of outreach proxies including managerial and operational efficiency (as control variables) on financial sustainability and profitability of SACCOs, as shown in Figure 1 below.

Research Hypothesis

Based on the empirical and theoretical studies reviewed, this study developed and tested the following research hypotheses.

H_1. Number of active borrowers has positive and statistically significant effect on financial sustainability and profitability.

H_2. Gross loan to asset ratio has positive and statistically significant effect on financial sustainability and profitability.

H_3. Yield on gross loan portfolio has positive and statistically significant effect on financial sustainability and profitability.

H_4. Proportion of women borrowers has positive and statistically significant effect on financial sustainability and profitability.

H_5. Average loan size has positive and statistically significant effect on financial sustainability and profitability.

H_6. Management efficiency has positive and statistically significant effect on financial sustainability and profitability.

H_7. Operational efficiency has positive and statistically significant effect on financial sustainability and profitability.

Materials and Methods

This study attempted to evaluate the effect of outreach on the financial sustainably and profitability of SACCOs in eastern Ethiopia, particularly at Dire Dawa City Administration and East Hararghe zone. It is a densely populated and drought prone part of the country, wherein majority of the people are poor (Henock, 2019). To this effect, many SACCOs are organized with the support of NGOs and the government to break the poverty cycle.

In light of the research objective, the hypotheses developed and the quantitative nature of the data, this study has employed a quantitative approach to investigate the effect of outreach on SACCOs' financial sustainability and profitability. Accordingly, it has adopted an explanatory research design to realize the stated objectives. As noted by Kothari (2008), the explanatory research design examines the cause and effect relationships between dependent and independent variables.

The total number of SACCOs found and operated in the study area, eastern Ethiopia, are 395. However, due to limited capacity of the supervisory body and of the SACCOs themselves, the majority of them have not been audited annually. However, 33 SACCOs were audited for the last three consecutive years from 2017 to 2019, which guaranteed that those SACCOs were considered in this study. Thus, the study considered SACCOs operating at least for more than three years and has complete audited financial statements for three consecutive years.

This circumstance implies that the study used a purposive sampling technique when selecting only SACCOs which are active, have completed three years of operation and have audited financial statements over the study period, since most of the SACCOs in the area are not audited annually.

The Data Type and Source

The study used secondary data collected from annual audited financial statements of sampled SACCOs, which have been collected from concerned government bodies (East Hararghe Zone and Dire Dawa City Administration cooperative promotion office) through document review to increase reliability of the data. The data were of a strongly balanced panel type, which captured both cross-sectional and time series behaviors.

Methods of Data Analysis

The study used both descriptive statistics and econometric tools to analyze the data and address the predefined objective. The former includes simple descriptive methods such as: mean, maximum, minimum, standard deviations and other simple statistical tools that enable to better understand the existing situation and analyze the general trends of the data. The study substantiated the descriptive analysis through manipulating econometric models to

examine causal relationship between the explanatory and dependent covariates. In this regard, the study employed a Random Effect Model to identify the explanatory variables that significantly affect the financial sustainability and profitability of SACCOs.

Definition and Measurements of Variables

Dependent variables

The dependent variables in this study were financial sustainability and profitability of SACCOs, which were measured by financial self-sufficiency (FSS) and return on asset (ROA). The FSS was measured as the ratio of Adjusted Operating Income to Adjusted Operating Expenses, which is the sum of financial, operating and loan loss provision expense. The adjustment was crucial to show the true financial picture of an institution on an unsubsidized basis, where funds would be raised on the commercial market, rather than through donor grants or subsidized capital (Marwa, 2015). Financially sustainable SACCOs are profitable enough to maintain and expand their services without continued injections of subsidies or donor funds (World Bank, 2003). In short, FSS ratio can be computed as follows:

$$FSS = \frac{\text{Adjusted Financial Revenue}}{\text{Adjusted (Financial+Operating+Loan loss provision) Expenses}} \quad \text{.........................} \quad (1)$$

In order to measure profitability of financial institutions, different ratios may be used. The commonly used ratios are Return on Assets (ROA) and Return on Equity (ROE) (Nyamsogoro, 2010; Tucker and Miles, 2004). Due to data limitation, this study used the former *i.e.* ROA to measure profitability of SACCOs. Return on Assets (ROA) measures the overall profitability and reflects both the profit margin and how the institution is efficient in using the total assets to generate revenue (Brealey *et al.*, 2006). ROA is calculated as the ratio of the net income to the total assets.

$$ROA = \frac{\text{Net Income}}{\text{Average Total Asset}} \quad \text{...} \quad (2)$$

Independent variables

According to Microfinance Information Exchange (MIX) (2010), loan outreach can be assessed by an annual comparative analysis through measurement of several variables including: number of active borrowers and gross loan portfolio as a proxy of breadth, and average loan balance per borrower and percentage of woman borrowers as a proxy of depth of outreach. Likewise, previous studies (Abinet, 2015; Nara, 2013; Zerai and Rani, 2012 and Meyer, 2002) used similar indicators in their framework, for measuring microfinance outreach. Tilahun (2013) and Okomu (2007) were also among others who used gross loan to total asset ratio to measure breadth of outreach. Moreover, Gashaw (2014) and Millson (2013) included yield to gross loan portfolio in their models as a cost of outreach indicator. Following this convention, this study also used all the loan outreach indicators, including managerial and operational efficiency as control variables, to measure the effect of outreach indicators on financial sustainability and profitability of SACCOs in Eastern Ethiopia. Table 1 presents the summary of variables and their expected effect on the dependent variable. Some of the variables were computed to their log form for compatibility of the regression.

Table 1. Summary of variables and their expected relationship

Category	Variable Name	Measurement / proxies used	Expected Effect
Dependent Variables	Financial Sustainability (FSS)	Adjusted operating income to adjusted operating expenses	
	Return on Asset (ROA)	Net Income/ Total Asset	
Independent Variable	Number of active borrowers (NAB)	Natural logarithm of (Number of active borrowers)	+
	Gross loan to Asset ratio (GLA)	Gross loan portfolio/ Total Asset	+
	Yield on gross loan portfolio (GPY)	Financial revenue / Gross Loan Portfolio	+
	Portion of women borrowers (PWB)	Number of active women borrowers/ Total number of active borrowers	+/-
	Average loan size (ALS)	Natural logarithm of (Gross Loan Portfolio /Number of Active borrowers)	+/-
	Managerial Efficiency (MGE)	Operating Expense/Operating Income	+
	Operational Efficiency (OPE)	Cost/ Income	+

Source: Developed by author based on the literature

To identify the effect of outreach indicators on the sustainability and profitability of SACCOs this research formulated the following econometric models.

$$FSS_{it} = \alpha + \beta_1(NAB)_{it} + \beta_2(GLA)_{it} + \beta_3(GPY)_{it} + \beta_4(PWB)_{it} + \beta_5(ALS)_{it} + \beta_6(MGE)_{it} + \beta_7(OPE)_{it} + \varepsilon_{it}$$

$$ROA_{it} = \alpha + \beta_1(NAB)_{it} + \beta_2(GLA)_{it} + \beta_3(GPY)_{it} + \beta_4(PWB)_{it} + \beta_5(ALS)_{it} + \beta_6(MGE)_{it} + \beta_7(OPE)_{it} + \varepsilon_{it}$$

Where FSS is the Financial Sustainability, ROA is the Return On Asset, NAB is the Number of Active Borrowers (breadth of outreach), GLA is the Gross Loan portfolio to Asset ratio (breadth of outreach), GPY is the Yield on Gross Loan Portfolio (cost of outreach), PWB is the Portion of Women Borrowers (depth of outreach), ALS is the Average Loan Size (depth of outreach), MGE is the Managerial Efficiency (control variable) and OPE is the Operational Efficiency (control variable), i is the ith SACCOs, tis the time period, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ and β_7 are the coefficients for each independent variables in the model, ε_{it} is the error term.

Result and Discussion

Descriptive result

A value greater than 105%for financial sustainability indicates that a SACCO is financially self-sufficient, and a value below this point indicates that it is not self-sufficient (WOCCU, 2011). As indicated in Table 2, the average value of financial sustainability is 0.69 (69%) which is below the breakeven/threshold level for financial sustainability. The result depicted that, the sample SACCOs in the study period were not financially sustainable and the sector cannot be self-reliant without external assistance like donors and subsidies from the concerned body. Meyer (2002) argued that many SACCOs have been unsustainable for various reasons, which is a finding against Henock (2019) in the same

study area on a similar issue. The maximum and minimum values of this variable are 1.30 (130%) and 0.15 (15%), respectively (see Table 2). The result shows that, the financial sustainability of sampled SACCOs over the study period ranges from 15% (too much dependence on donation and subsidies) to 130% (financially self-sufficient). Its standard deviation of 0.299 (30%) illustrates the disparity of financial sustainability among sampled SACCOs in the study area.

Return on Asset is a ratio of net income and average total asset, which measures the amount of profit generated per birr of investment in assets. A ratio of 10% and above indicates that the SACCOs are profitable and have the capacity to build institutional capital (WOCCU, 2011).According to Table 2, the average value of SACCOs' profitability is 0.76 (76%), which is above the breakeven/threshold level of profitability, which indicates that the sampled SACCOs on average earned a profit of 0.76 cents from one birr invested in their asset during the study period. The maximum value of the return on asset is 1.25 (125%) and the minimum value is 0.19 (19%). This shows that profitable SACCOs earned 1 birr and 25 cents of profit for a birr invested on assets. On the other hand, the least profitable SACCOs earned 19 cents of profit for each birr invested in their assets during the study period. The standard deviation of 0.28 (28%) indicates the disparity of SACCOs' profitability performance.

Table 2.Descriptive statistics for the dependent variables

Variable	Obs = 99	Mean	Std. Dev.	Min	Max
FSS		0.6913	0.2994	0.1466	1.3086
ROA		0.7630	0.2773	0.1908	1.2512

Source: Author's own calculations.

Number of active borrowers (NAB) measures the extent of providing financial services to the low income or underserved clients. As indicated in Table 3, the average value of active borrowers served is 4.20 in its log value, which is equal to 15,973.5 borrowers in its real value. The MIX benchmark classifies the breadth of outreach as large (greater than 30,000 number of borrowers), medium (10,000-30,000 number of borrowers), and small (if less than 10,000 number of borrowers) (Bayeh, 2012). Thus, the breadth of outreach for sampled SACCOs in the study area is medium, with average borrowers of 15,974 individuals. The maximum and minimum values of this variable are 7.09 and 2.99 (about 12,302,688 and 990active loan clients) respectively, with the standard deviation of0.738 (about 6).

Gross loan portfolio to asset (GLA) measures the amount of assets invested on gross loan portfolio. A higher gross loan to asset ratio indicates most of the institution's funds are invested on clients as a loan, which increases outreach to the poor. The average value of this variable is 1.06 (106%), which indicates that sample SACCOs invested 106% of their assets on loan portfolios during the study period. The maximum and minimum value of this variable is 2.71 (271%) and 0 (0%) respectively, with the standard deviation of 0.53 (53%).

Yield on gross loan portfolio (GPY) indicates the efficiency of SACCOs in generating cash revenue out of their resources. As per the WOCCU's standard, SACCOs are expected to earn at least 10% income on the loans disbursed to their members. Table 3 indicates that sampled SACCOs generate 0.058 (5.8%) income from the loans given to customers during the study period. The result shows that sampled SACCOs are not generating enough income to cover their operating and financial costs. The maximum yield on the gross loan portfolio for this study is 0.1 (10%), which is equal to the WOCCU's expected level. However, for

SACCOs in the study area, as they are earning too low a rate of return, their sustainability and profitability potential are in question.

Portion of Women Borrowers (PWB) indicates the percentage of women borrowers to total borrowers. The higher the percentage is, the higher the depth of outreach. SACCOs in this study had an average value of 0.65 (65%), which implies that sampled SACCOs in the study area provide 65% of loans to women members. The maximum and minimum value of this variable is 1 (100%) and 0.071 (7.1%), respectively. This shows that some of the sampled SACCOs provide up to 100% of loans to women beneficiaries.

Average Loan Size (ALS) shows the average value of 8.69 in its log value equal to 4.92 Million Ethiopian Birr, which is the average loan size of SACCOs to the number of active borrowers during the study period. The maximum and minimum values of this variable are 10.32 and 5.85 in its natural logarithm value, which is equal to 20 Billion and 702,101.7 Birr respectively, with the standard deviation value of 0.89 in its natural logarithm implying that SACCOs in the sample vary in their loan sizes.

Managerial Efficiency is the ratio of operating income to expense. Based on the descriptive result, the mean value of managerial efficiency is 0.70 (70%), which indicates that on average the sampled SACCOs incurred 0.70 cents in operating costs like salaries, supplies, loan losses, and other administrative costs to generate one birr of operating income during the study period. The maximum and minimum value of managerial efficiency is 1.31 (1.31%) and 0.19 (19%) respectively, with a standard deviation of 0.28. The minimum value shows that managerially efficient SACCOs incurred operating costs of 0.19 cents to generate one birr of operating income. On the other hand, managerially less-efficient SACCOs incurred operating costs of 1 birr and 31 cents to generate one birr in operating income, which resulted in a loss of 31 cents.

Table 3. Descriptive statistics for the independent variables

Variable	Obs = 99	Mean	Std. Dev.	Min	Max
NAB		4.2035	0.7384	2.9957	7.0900
GLA		1.0648	0.526	0	2.7082
GPY		0.0587	0.0228	0	0.10
PWB		0.6533	0.2544	0.0714	1.00
ALS		8.6922	0.8946	5.8465	10.316
MGE		0.7058	0.2832	0.1974	1.3086
OPE		0.9646	0.1798	0.5862	1.7119

Source: Author's own calculations.

Operational Efficiency is the ratio of cost to income. Based on the descriptive result, the mean value of operational efficiency of SACCOs is 0.96 (96%), indicating that on average sampled SACCOs incurred 0.96 cents total cost/expense to generate one birr total income/revenue during the study period. The maximum value of operating efficiency is 1.71 (171%) and the minimum value is 0.59 (59%) with a standard deviation of 0.18. The minimum value indicates that operationally efficient SACCOs incurred a cost of 0.59 cents to generate one birr of income. On the other hand, operationally least efficient SACCOs incurred a cost of 1 birr and 71 cents to generate one birr of income during the study period.

Regression Result

Effect of Outreach on Financial Sustainability (FSS)

Table 4 presents the random effect regression results to identify the effect of outreach on financial sustainability of SACCOs in eastern Ethiopia. The variables included in the model explained about 85% of the total variation on financial sustainability which is a reasonably good fit. This implies that the explanatory variables (such as, number of active borrowers, gross loan to asset, yield on gross loan portfolio, percentage of women borrowers, average loan size, operational and managerial efficiency) jointly explained about 85% of the total variation in the financial sustainability.

The regression result indicates that gross loan to asset, yield on gross loan portfolio, managerial and operational efficiency has a statistically significant and positive effect on the financial sustainability of SACCOs in Eastern Ethiopia. However, average loan size has a statistically significant and negative effect on the financial sustainability of SACCOs as to the model result on Table 4.

Gross loan to asset ratio is a proxy for breadth of outreach, which indicates the amount of assets SACCOs invest on their gross loan portfolio. A higher gross loan to asset ratio indicates that most of the institution's funds are invested on clients as a loan, which enhances outreach to the poor. The model result reveals that gross loan to asset ratio and financial sustainability has a positive and statistically significant relationship at 5% significance level. The gross loan portfolio investment is the main source of income for SACCOs, which infers that higher loan disbursement may guarantee better interest revenue and profit, which may secure financial sustainability. The result is consistent with the findings of Abinet (2015), Tilahun (2013) and Cull *et al.* (2007) who reported statistically significant and positive relationships between loan intensity (gross loan to asset ratio) and MFIs financial self-sufficiency. However, this result contradicts with findings of Okumu (2007),who documented a negative causation between loans to asset ratio and MFI's sustainability. Based on the model result, it is easy to conclude that an increase in loan intensity leads to increased financial sustainability.

Yield on gross loan portfolio is a proxy measure for interest rates charged by SACCOs on loans disbursed to clients, mostly their members. The result shows that yield and financial sustainability has a statistically significant and positive relationship (see Table 4).This implies that when the interest rate on client loans increases then SACCOs could generate better interest income and financial sustainability could be enhanced. This finding corroborated with Gashaw (2014), Cull *et al.* (2007) and Woller and Schreiner (2002) found statistically significant and positive relationships between financial sustainability and yield from gross loans. They have argued for the possibility of better yield, thereby meeting both the social mission and viability given that the clients are economically active poor. As per the result, an increase in yield leads to improved financial sustainability without compromising outreach.

A **managerial efficiency ratio** is a financial ratio designed to measure the efficiency of management in using its assets (working capital or other resources) and managing its liabilities effectively in the short-run. The model results indicate that managerial efficiency has a positive and statistically significant effect on financial sustainability of SACCOs. It is expected that when a firm has better managerial efficiency (the lower ratio), the firm is either getting more income with a determined level of resources or incurring less expenses that in

turn leads to improved profitability and sustainability of SACCOs (Velery, 2018). The result substantiated with the findings of Habtamu (2012) and Mwaura (2005); the better the management's efficiency in utilizing the available resources the higher the financial performance that results into sustainability of SACCOs.

Likewise, **Operational Efficiency** is another performance measure used as an indicator of management's ability to control the cost and how well SACCOs are reforming their operations. It takes into account the cost of the input and/or the price of output in maximizing income. The model result on Table 4 indicates that the coefficient of the operational efficiency is positive and statistically significant at 10% significance level. The result shows that minimizing costs would certainly improve a SACCO's financial sustainability. This result is consistent with the findings of Henock (2019), Marwa (2015) and Kinde (2012). These all imply that an increment in managerial and operational efficiency (controlling cost) increases the financial sustainability of SACCOs.

Table 4. Random effect model result for identifying determinants of FSS

Explanatory variables	Coefficient	Std. Err.	Z-value
NAB	-0.0179	0.0203	-0.88
GLA	0.0638**	0.0321	1.99
GPY	1.6638***	0.6145	2.71
PWB	-0.0149	0.0531	-0.28
ALS	-0.0356**	0.0172	-2.07
MGE	1.0113***	0.0481	21.06
OPE	0.1319*	0.0694	1.90
Constant	0.0790	0.1663	0.48
R^2 Within	0.8563	sigma_u	0.00
R^2 Between	0.9089	sigma_e	0.12
R^2 Overall	0.8523	Prob > χ^2	0.0000

*** and** implies significant at 1 and 5% level of significance, respectively.

Source: Author's own computation, 2020.

Average loan size is a proxy for depth of outreach, which indicates the average loan size per the number of borrowers. It is generally perceived that the smaller its size (smaller loans) indicates greater depth of outreach (Cull *et al.*, 2007). However, MFIs offering small-size loans with shorter maturity attract high transaction costs, which leads to declining sustainability and profitability (Lupenu and Zeller, 2002). Average loan size has negative and statistically significant effect on financial sustainability of SACCOs as presented on Table 4. This indicates that a SACCO's success is associated with smaller loan sizes since it is significantly correlated with the borrower's poverty level (Schreiner, 2002). The result is consistent with the result of Abinet (2015) and Nyamsogoro (2010), who argued that MFI success should be measured based on the depth of their outreach (how many poor clients they are able to reach). However, the result is inconsistent with the finding of Joseph (2013), Quayes (2012) and Ganka (2010),who conclude that profitability relates to selling bigger loans sizes, evidence for the strong tradeoff between serving the poor and being financially sustainable.

Effect of Outreach on profitability (ROA)

Table 5 presents the random effect regression results to identify the effect of outreach on profitability of SACCOs in Eastern Ethiopia. The variables included in the model explained about 64% of the total variation of profitability scores, which is reasonably a good

fit. This implies that the explanatory variables (such as: number of active borrowers, gross loan to asset, yield on gross loan portfolio, portion of women borrowers, average loan size, managerial and operational efficiency) jointly explained about 64% of the total variation in the profitability.

The regression result of the analysis indicates that gross loan to asset, managerial efficiency and average loan size has statistically significant and positive effect on the profitability of SACCOs. However, the proportion of women borrowers and number of active borrowers has statistically significant and negative effect on the profitability of SACCOs as to the model result on Table 5.

The model result shows that **gross loan to asset** and profitability has a positive and statistically significant relationship. The gross loan portfolio is the main source of income to SACCOs; as a result, higher loan disbursement would result into better interest revenue and profits. The result is consistent with the findings of Kipesha and Zhang (2013) and Cull *et al.* (2007), who found gross loans to assets a statistically significant variable as determinants of financial performance. However, Tilahun (2013) argues that MFIs risk increases when their loan to asset ratio increases, and profitability may decrease. Based on Table 5 an increase in the ratio of gross loan to asset increases the profitability of SACCOs.

The model result on Table 5 indicates that **managerial efficiency** has positive and statistically significant effect on the profitability of SACCOs. The result shows that, the higher the managerial efficiency in utilizing the available resources, the higher the profitability. This output corroborated with the findings of Habtamu (2012) and Mwaura (2005), who found a significant and positive relationship between management efficiency and profitability.

Based on the model result, the effect of **average loan size** is positive and statistically significant at 10% significance level. This indicates that a SACCO's profitability is associated with higher loan sizes since larger loans are associated with better cost efficiency, and there is worry about default risk in SACCOs given that they are 100% secure through their own savings and members' guarantor. The model result is consistent with the findings of Ganka (2010) and Schreiner (2002), who argued that SACCOs will be unable to sustain their operations without profits and concluded that profitability strongly related to disbursing larger loans, which was supported by Adhikary and Papachristou (2014) and Paxton (2002), who also found a positive relationship with profitability. As per the result, an increase in managerial efficiency and average loan size increases the profitability of SACCOs.

Table 5. Random effect model for identifying determinants of ROA

Explanatory Variables	Coefficient	Std. Err.	Z-Value
NAB	-0.049*	0.0295	-1.66
GLA	0.3222***	0.0466	6.91
GPY	0.9123	0.8918	1.02
PWB	-0.2257***	0.077	-2.93
ALS	0.0444*	0.0249	1.78
MGE	0.5653***	0.0697	8.11
OPE	-0.0096	0.1007	-0.10
cons	-0.0562	0.2414	-0.23
R^2 Within	0.6396	sigma_u	0.00
R^2 Between	0.2812	sigma_e	0.17
R^2 Overall	0.6374	Prob > χ^2	0.0000

*** and** implies significant at 1 and 5% level of significance, respectively.
Source: Author's own computation, 2020.

The **portion of women borrowers** has a negative and statistically significant effect on profitability of SACCOs. This finding is consistent with the findings of Kipesha and Zhang (2013) and Oliveres-Polanco (2005), who reported a negative and significant relationship between percentage of women borrowers and MFI profitability, but in contradiction with the findings of Adhikary and Papachristou (2014) and Paxton (2002), who found that depth of outreach is positively related to profitability. Likewise, the **number of active borrowers** has a negative and statistically significant effect on profitability, which is supported by the findings of Cheminingwa (2013) and Ganka (2010), who reported a negative relationship between number of borrowers and profitability, as inefficiency increases as a result of increased number of borrowers. Contrarily, however, Nalusiba (2019) found that an increased number of borrowers generates more interest in SACCOs, hence increasing profitability and boosting sustainability in the long run. As per the result, an increase in the portion of women borrowers and number of active borrowers decreases the profitability of SACCOs in Eastern Ethiopia.

Conclusions and Recommendations

Conclusions

Based on the findings from the descriptive analysis, SACCOs in Eastern Ethiopia were profitable but not financially sustainable during the study period. This implies that SACCOs are not self-reliant without external assistance like donors and subsidies. As per the model result, it is easy to conclude that financial sustainability and profitability of SACCOs is best explained by the explanatory variables included in the model.

The findings demonstrate that gross loan to asset, yield on gross loan portfolio, managerial and operational efficiency has a statistically significant and positive effect on the financial sustainability, which indicates that an increase in those variables result into better financial sustainability. However, average loan size has significant negative effect on the financial sustainability of SACCOs in Eastern Ethiopia.

In addition, it can be concluded that gross loan to asset, managerial efficiency and average loan size has a significant positive effect on profitability. However, the portion of women borrowers and number of active borrowers has a significant negative effect on the profitability of SACCOs in Eastern Ethiopia.

Furthermore, this study also concludes that outreach and financial sustainability and profitability of SACCOs are complimentary, since there is no evidence of trade-off between them. Thus, SACCOs should work to achieve both outreach and financial sustainability and profitability at the same time.

Recommendations

Based on the findings, the study forwarded the following operational and policy recommendations:

It is recommended that SACCOs should augment their self-sufficiency while serving the poor through increasing amounts of asset invested to loan, yield on gross loan and improving their managerial and operational efficiency.

SACCOs have to improve their returns by charging appropriate interest rates on loans to cover operational, financial and other administrative costs, expanding their services and

utilizing their available resources to the maximum possible level to sustain themselves as alternative financial service providers.

SACCOs should increase gross loan portfolio investment (volume of sales) to serve a large number of borrowers in order to benefit from the economics of scale since the total cost will be distributed over a large number of borrowers and volume of outputs which will reduce costs of production. Thus, the higher the amount of loan is the more enhanced the interest revenue which leads to financial sustainability.

SACCOs should also give education and training to members on credit utilization and management in order to increase loan demand and help ensure that loans are invested into productive areas.

SACCOs have to improve their operational and managerial efficiency by providing continuous training and information for management committee members and hiring high caliber managers in the field in order to bring good governance and better financial management and to remain competitive, profitable and sustainable.

Finally, all the government bodies in charge of cooperating at various levels should pay great attention through continuously supervising, inspecting, auditing and developing the regulatory environment in order to modernize the financial system, make it more financially prudent, and help ensure that viable financial institutions can highly contribute to the outreach of financial services in the country.

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Appendixes

Appendix 1

Multi-collinearity test for FSS and ROA

Variable	VIF	1/VIF
GLA	1.96	0.509692
ALS	1.62	0.615442
NAB	1.55	0.645049
CoOR	1.35	0.741325
MGE	1.27	0.785979
WB	1.25	0.798541
OPE	1.07	0.935532
Mean VIF	1.44	

Appendix 2a

Heteroskedasticity test for FSS

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of FSS
chi2(1) = 3.12
Prob > chi2 = 0.0775

Appendix 2b

Heteroskedasticity test for ROA

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of ROA
chi2(1) = 3.16
Prob > chi2 = 0.0756

Appendix 3a

Model specification test for FSS

Breusch and Pagan Lagrangian multiplier test for random effects
$FSS[YEAR,t] = Xb + u[YEAR] + e[YEAR,t]$

Estimated results:

	Var	sd = sqrt(Var)
FSS2	.0896244	.2993734
e	.0141337	.1188851
u	0	0

Test: Var(u) = 0
chibar2(01) = 0.00
Prob > chibar2 = 1.0000

Appendix 3b

Model specification test for ROA

Breusch and Pagan Lagrangian multiplier test for random effects

$$ROA[YEAR,t] = Xb + u[YEAR] + e[YEAR,t]$$

Estimated results:

	Var	sd = sqrt(Var)
ROA	.0769093	.2773253
e	.0303776	.1742918
u	0	0

Test: Var(u) = 0

chibar2(01) = 0.00

Prob > chibar2 = 1.0000

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