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FIRM CHARACTERISTICS AND FINANCIAL PERFORMANCE OF DEPOSIT TAKING SAVINGS AND CREDIT CO-OPERATIVES IN NAIROBI CITY COUNTY, KENYA

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ABSTRACT

Financial systems serve as frameworks for providing money changing and payment processing services; quality, asset transforming in terms of their denomination and maturity and lately control and management of risks. The SACCOs perform a key role in the financial sector of Kenya which span from access, mobilization of savings and also creation of wealth. The study's objective was to ascertain the effect of firm characteristics on performance of the SACCOs in Nairobi City County, Kenya. Specifically, the assessment sought to assess the effect of firm size, management efficiency, assets quality and capital adequacy on financial performance of SACCOs in Nairobi City County, Kenya. The assessment was anchored on agency, efficiency structure and market power theories. Causal research design was utilized. Target population is the licensed deposit taking SACCOs in Nairobi City County that were fully in existing for the study period which is 2014 to 2018. The total number of SACCOs that were fully operation in Nairobi City County within this period is forty-two (42). A census was utilized due to the few number of target population. The analysis was premised on secondary data to be assembled via data review guide. Both descriptive and panel regression analysis were done. Diagnostics tests for multicollinearity and normality was undertaken before the inferential analysis. Ethical considerations were also complied within the entire research. It was concluded that firm size, management efficiency, asset quality and capital adequacy had a positive effect on financial performance of the SACCOs. It was recommended that the small SACCOs should consider merging with other SACCOs so as to increase their size and in return their asset base. The managers and other employers should be trained on how to manage the SACCOs so as to enhance their efficiency and effectiveness. The management of the SACCOs should evaluate the quality of assets they intend to use in the daily operation of the SACCOs. The SACCOs should ensure that the have the right capital that is adequate to ensure that the SACCOs can meet their prime function which is lending.

Keywords: *Firm Size, Management Efficiency, Assets Quality and Capital Adequacy on Financial Performance*

INTRODUCTION

Worldwide, financial system of countries play significant role in allocating scarce economic resources and sharing of the risk of future flows (Cekrezi, 2015). The World Council of Credit Unions (WOCCU) indicated that in the year 2014, there was a high record of more than 57,000

Credit Unions located in over one hundred and five (105) countries in six (6) continents. The first Savings and Credit Co-operative Society was started in Germany in 1849 by Herman Schulze and William Raiffersen. The SACCO Society was introduced to assist people overcome economic problems during the time of famine that prevailed there during that time (Sharma, 2018). Later there was a vast establishment of SACCOs in Europe, Canada, United States, Australia and Ireland. In fact, in many regions of these countries, SACCOs are much larger than the commercial banks (Poli, 2019).

In Africa, there is an estimation of over 60 million people who depend on SACCOs. Challenges experienced by the SACCOs in Africa are similar to those encountered by their counterparts in other parts globally (Kinyua, 2013). Notably, the economies under which SACCOs function are characterized marred by weak governance systems and unfavorable legislation. Particularly, the challenges that put the survival of SACCO's under threat can financially be categorized as internal and external (Adesina, Nwidobie, & Amadi, 2018). The internal challenges range from leadership issues, inadequate resources, insufficient technology and increased demand for quality services, ethics and integrity and firm characteristics of SACCOs.

The SACCOs perform a key role in the finance sector of Kenya which span from access, mobilization of savings and also creation of wealth. Kenyan SACCOs focus on mobilization of savings for lending to such to members at some interest. The subsector has therefore been earmarked as a critical player in the realization of the 10% annual economy growth envisaged by Vision 2030 (SASRA, 2013). The subsector in Kenya is two-tiered with deposit taking and non-deposit taking SACCOs. The deposit taking SACCOs (DTSs) carry out both Front Office Services Activity (FOSA) and Back Office Services Activity (BOSA). This in turn enables them to closely mirror the operation of commercial banks. Such SACCOs are regulated, supervised and licensed by SASRA under the SACCO Societies Act, 2008.

Financial performance of Nairobi County SACCOs in terms of ROA has been varying for a period of time, for instance in year 2014 ROA was report to have declined to 9%, followed by a decrease in 2015 and 2016 of 12.4% and 14.8% respectively (SASRA 2017). The overall analysis in year 2017 depicted a diminished growth rate in total assets, gross loan and total deposits and was 12.4percent, 11.3percent and 12percent correspondingly, a contrast to growth rates of 11.2percent, 15.3percent and 14.8percent in 2016. The loan loss allowance being the indicator for the NPL rose to Kshs 10.7 Billion which reflected a 23.4percent increase from Kshs 8.6 Billion in 2016(SASRA 2018).

Based on asset base according to WOCCU Statistical reports (2014) in global ranking of Credit Unions, the Kenyan SACCO subsector was reported to have recorded an impressive performance which saw it at 11th position in the year 2014, which was up from the previous position 13 of the year 2013. The SACCO sector inhabits an intended function in the socio-economic improvement of Kenya. International cooperative alliance (ICA) survey indicated that the SACCO sector in Kenyan is preeminent with the maximum resource armament in Africa and the seventh in the world (Barus et al. 2017). In Kenya, cooperative subsector has grown at 25% in the past few years. The segment has mutual savings to the tune of over KSh. 380 billion and tangible resources of over KSh. 200 billion (SASRA 2014 Annual Report).

Statement of the Problem

The performance of SACCOs in Kenya was indicated to be generally on a declining trend, 13% decrease was reported in 2014, while 2015 and 2016 had a further decline of 6% and 10% in performance respectively (SASRA, 2017). SACCOs in Nairobi City County experienced decline in performance of; 9% decrease in 2014, 2015 and 2016 had a further decline of 12.4% and

14.8% respectively (SASRA, 2017). SACCOs in 2017 were reported to have made losses running into billions of Kenyan Shillings with notable SACCOs losing KSh1B. Sacco societies serve as vital components of the financial system of nations as they play a momentous function in the global economy (Ndung'u, 2010). In Kenya, the Sacco industry is a critical player in achieving 10% yearly economic expansion target as visualized in Vision 2030.

The financial intermediation roles performed by SACCOs are hinge on their profitability. The poor performance of SACCOs has through the years been a cause of apprehension to variety of stakeholders spanning form policy makers to academic researchers. ROA of SACCOs was reported to be 17%, 14% and 13% in the years 2015, 2016 and 2017 respectively. Ayano (2016) indicated that the debate on determinants of firm performance is an exciting one since they are dynamic through time to time and differ from firm to firm due the nature of operation of firms from place to place.

However previous studies (Gruian, 2010; Ochingo, 2018; Muthoni, 2014; Kitonga, 2013) have shown that the operations of SACCOs are threatened by lack of good financial management resulting in losses. Some of the studies were based on primary data which can be subjective; some were done in other countries and not Kenya. Some of the assessments utilized multiple regressions in the analysis but the current analysis utilised panel regression technique. Some of the studies isolated key firm characteristics while some were based on commercial banks. The current study sought to address the empirical gaps by focusing on firm characteristic and their influence on performance of DT-Saccos in Nairobi.

General Objective

To determine the effect of firm characteristics on financial performance of Deposit Taking SACCOs in Nairobi City County, Kenya.

Specific Objectives

i. To evaluate the effect of firm size on financial performance of Deposit Taking SACCOs in Nairobi City County, Kenya.
ii. To examine the effect of management efficiency on financial performance of Deposit Taking SACCOs in Nairobi City County, Kenya.
iii. To investigate the effect of asset quality on financial performance of Deposit Taking SACCOs in Nairobi City County, Kenya.
iv. To assess the effect of capital adequacy on financial performance of Deposit Taking SACCOs in Nairobi City County, Kenya.

Scope of the Study

The conceptual scope of the study was the firm size, efficiency, quality of asset, adequacy of capital and profitability. The contextual scope was the forty-two deposit taking SACCOs in Nairobi City County, Kenya. The period 2014 to 2018 was covered. The study adopted panel regression technique, thus the methodological scope.

LITERATURE REVIEW

Theoretical Review

Agency Theory

The theory was developed by Jensen and Meckling (1976). It helps in explaining the1relationship between institution's management1and the owners or the shareholders. It explains that in most cases agency conflicts can arise. The team in charge of managing an organization is often classified as an agent that has been given a contract by the owners (shareholders). In this case, the activities of the managers are guided by the interests of the owners and the institution's goal of achieving a financial growth. The theory is based on the

preposition that in the context of a firm, there exists the owners as well as those managing the operations and general affairs of the firm (managers) (Gul, Irshad & Zaman, 2011).

This theory helps in implementing the various governance mechanisms to control the agents' action in the jointly held corporations (Gul, Irshad & Zaman, 2011). The relevance of this presumption to the research lies on its explanation on how the institution's performance is contingent on the way the executives execute their profit maximizing responsibilities as well as cost minimization. It is based on the assumption that the executives have the propensity to consider their interests above that of the owners (shareholders). For instance, the may have the tendency to get involved in those activities whose ultimate benefit does not go to the owners but to themselves (Acarvci & Calim, 2013). This eventually affects firm performance (profitability) negatively.

Efficiency Structure Theory

The proponent of this theory is Demesetz (1973). Two hypotheses underpin the preposition of this theory namely: X-efficiency and scale efficiency. The former is based on notion that banks having sound management in place possess the ability of controlling costs and having increasing revenue, thus, resulting to banks towards best-practices and cost curve of lower bound (Ang & Longstaff, 2013). The latter is based on the view that sound operational scale is attained by some banking institutions, therefore, lower cost. Lower cost lead to improvements in profitability and subsequently enhance the growth rate for the scale efficient banks.

The theory holds the view that bank earnings, portfolio composition as well as shareholders' returns reflect the decisions taken by managers of banks internally and the overall bank policy decisions. In view of this theory, both inside and external attributes impact on the performance of banks (Fisseha, 2015). Efficiency structure theory in respect to this paper explains the associations emanating between management efficiency and profitability. The theory asserts that improved managerial scale efficiency results in high concentration and in turn profitability. Therefore, efficiency of management leads to larger market share and enhanced concentration in the market concentration.

Empirical Literature Review

Firm Size

In regard to firm size, Kinyua (2013) examined the correlation between size of SACCO and performance in Kenya. The SACCOs size was determined using total assets and deposits and turnover. It was established that size of SACCOs influence performance significantly. However, the study did not carry out diagnostics tests prior to inferential analysis. This paper conducted diagnostics tests to ensure that the research data is okay before proceeding to inferential analysis.

Kariuki and Wafula (2016) did a study on efficiency and firm size on financial performance of Kenyan Saccos. The panel design was utilised and data drawn from SACCOs yearly financial statements for the period 2011 to 2014. The assessment used descriptive, correlational and panel regression analysis. Regression findings indicated a significant positive effect of firm size on SACCOs' performance. Despite adopting panel regression, diagnostic tests for panel regression were not undertaken. This paper filled the methodological gaps by undertaken all relevant diagnostics.

Management Efficiency

An assessment was done by Onjala (2012), on the determinant of bank profitability in Kenya. It utilized descriptive research design with the analysis being based on regression and correlation analysis. The 5% significance level was the premise of the test. The study findings indicate that efficiency has a positive influence on both ROA and ROE. The forecast variables represented 95

percent of the variance in ROE. The assessment was however on commercial banks unlike this research which centered on SACCOs.

Fujo and Ali (2016) did a research on factors that influence the SACCOs' financial performance in Kilifi County. Descriptive statistics, regression and correlation analysis were employed in the analysis of data. Regression results depicted that efficiency of management has a positive significant effect on performance among SACCOs in Kilifi, however the study involved data collected using questionnaires. Questionnaires are subjective and can be characterized by biasness, whereas the current study will rely on secondary data as reported by SACCOs.

Asset Quality

On the area of asset quality, Okumu and Oyugi (2016) examined factors that influence SACCOs performance in Kisumu County. Quantitative data was analysed through inferential and descriptive statistics while qualitative data was analysed using content and thematic analysis. The results exhibited a positive and significant relationship between asset quality and Sacco performance. The study concluded that there is need to enhance the asset base of Sacco as such to foster superior firm performance. It was not suitable to carry out regression analysis on cross sectional data, thus the most appropriate design was descriptive research design.

Kariuki, Ngugi and Muturi (2016), assessed the link between quality of asset and efficiency in Kenyan Saccos. The examination utilized panel data. Census technique was employed thus 103 Saccos that were in operation during the transition period of regulations by SASRA. Data envelopment analysis was utilized in generating efficiency score. Efficiency was regressed against quality of asset while profitability, diversification and firm size were controlled. Results revealed a significant inverse connection between quality of asset and efficiency of Kenyan Saccos.

Capital Adequacy

The link between capital adequacy and financial performance in banks & SACCOs has been explained extensively. Umoru and Osemwegie (2016) assessed the linkage between adequacy of capital and financial performance of Nigeria's banks. The assessment covered 2007-2015 and the analysis used fixed generalized least squares. The results showed that the quality of asset significantly influenced performance of commercial bank. The study was nevertheless centered on Nigerian banks. This paper focused on SACCOs in the context of Kenya. Interestingly, diagnostics tests were not considered despite the use of panel data analysis.

On the effect of capital adequacy and performance of savings and credit cooperative societies in Kenya Barus *et al.,* (2017) did an exploratory research. A census of all SACCOs operating from 2011 to 2015 was selected. Primary data was utilised. Capital adequacy was found to significantly predict firm performance. The study notably was based on primary data (questionnaire) and therefore the data was cross-sectional implying an element of bias in the regression analysis adopted. Secondary data is to be used in the current assessment.

Conceptual Framework

The conceptual framework provides the diagrammatic linkage between the variables that is dependent and independent variables (Mugenda & Mugenda, 2013). The independent variables are firm size, management efficiency, quality of asset and capital adequacy while the dependent variable is the financial performance of SACCOs.

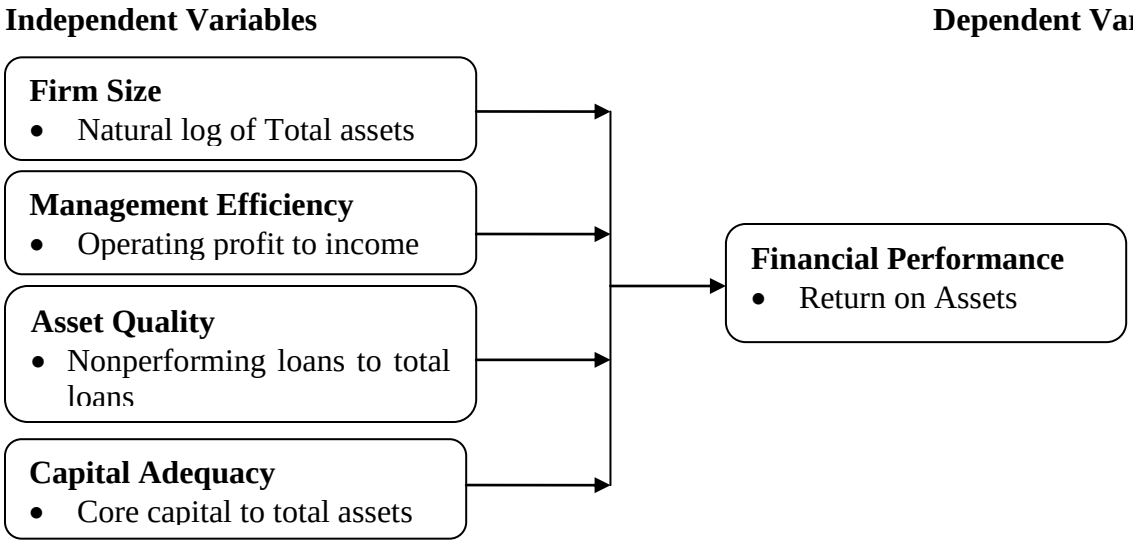

Figure 1: Conceptual framework

Source: Researchers Conceptualization (2021)

RESEARCH METHODOLOGY

Research Design

This paper used causal research design. As stated by Cooper & Schindler (2009), a causal design is hinged on establishing the what, where and how of a phenomenon. This is often based on a thorough investigation of research problems and rendering solutions thereafter.

Target Population

The target population was deposit taking SACCOs in Nairobi City County under SASRA fully in existence for the study period 2014 to 2018. The total number of SACCOs that were fully operational in Nairobi City County, within this period were forty-two (42). Census approach was utilized in this paper. The analysis considered all the deposit taking SACCOs licensed under SASRA and operational from 2014 to 2018.

Data Collection

The secondary data was used and it was collected on all research variables namely profitability, firm size, efficiency, asset quality and adequacy of capital. This was done using a secondary data guide.

Empirical Model

The data analysis was conducted using panel regression model. Therefore, financial performance is expressed as a function of firm characteristics which are firm size, efficiency, quality of asset and capital adequacy.

$ROA_{it} = \beta 0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \epsilon_{it}$

Where:

ROA_{it} – Financial Performance

$\beta 0$ - Constant

X_{1it} – Firm Size

X_{2it} –Management Efficiency

X_{3it} – Asset Quality

X_{4it} – Capital Adequacy

$\beta 1 – \beta 4$= Regression coefficients, measuring Variable Y sensitivity to a unit change in variable X

ϵ_{it}= Error term

FINDINGS

Descriptive Statistics Analysis

The study presents the research finding on the descriptive statistic in the data collected so as to establish the mean, maximum, minimum and standard deviations of the variables.

Table 1: Descriptive Statistics

	N	Min	Max	Mean	Std. Dev
ROA	210	-6.4	11.2	2.3114	3.6253
Firm Size	210	5.0332	10.7179	8.0621	1.1537
Management Efficiency	210	3.0778	8.6780	5.9741	1.3202
Asset Quality	210	0.0000	3.2010	0.1430	0.4139
Capital Adequacy	210	0.0036	5.7651	0.7120	1.0749

Source: Researchers (2021)

The study sought to establish the relationship between firm characteristics and financial performance of deposit taking savings and credit co-operatives in Nairobi City County, Kenya. From the findings, the study found that there was mean of 2.3114 for return on assets (ROA) and 28.3967 for return on equity (ROE). For the firm size, it was noted there was a mean of 8.0621, 5.9741 for management efficiency, 0.1430 for asset quality and 0.7120 for capital adequacy. There was a deviation of 3.6253 from the mean of ROA, 6.3799 from the mean of ROE, 1.1537 from the mean of firm size, 1.3202 from the mean of management efficiency, 0.4139 from the mean of asset quality and 1.0749 from the mean of capital adequacy.

Diagnostic Test Results

The researcher conducted various diagnostic tests to ensure that the assumptions of classical linear regression model (CLRM) were not violated and to choose the appropriate models for analysis in the event that CLRM assumptions were compromised. This section presents the results of the following diagnostic tests: test of Multicollinearity, Stationarity test, Normality test, Normality test, Heteroscedasticity test, Autocorrelation test and Hausman test.

Test for Multicollinearity

Table 2: Test for Multicollinearity

Variable	VIF	1/VIF
X1	4.76	0.210197
X2	4.15	0.241109
X4	1.37	0.731383
X3	1.1	0.910108
Mean VIF	2.84	

Source: Researchers (2021)

Multicollinearity was tested for the data used in the research and the degree is the key thing when measuring multicollinearity (Gujarati, 2014). This is mostly present in cases where the data used is in form of time series since variables being studied may follow a particular pattern. These variables might decrease or increase over the given duration. The researcher employed VIF test for determining whether there was adequate and sufficient evidence that multicollinearity was present and was an issue of concern. The results showed that the VIF factor was 2.84 and taking into consideration it was less than 10, there was no doubt that multicollinearity was not an issue since the recommended tolerance or acceptable value is 10.

Stationarity Test

The study employed Augmented Dickey Fuller unit root test (ADF) so as to check for stationarity of the data. If the data is found to contain unit root and require first difference in order to be stationary, then the variable in question will be deemed to have a long run relationship with the dependent variable and would therefore require a co-integration test to be conducted. If the exogenous data is run through ADF test and happens to be stationary at level, the data would be assumed to be affecting the model in the short run. The null hypothesis is that variable is not stationary.

Table 3: Firm Size

Augmented Dickey- Fuller test for unit root		Number of obs	210
		Interpolated Dickey - Fuller	
	Test Statistics	1% Critical Value	5% Critical Value	10% Critical Value
Z (t)	-3.274	-5.384	- 4.462	- 3.733
Mackinnon approximate p -value for Z (t) = 0.2204				

Source: Researchers (2021)

In this case the null hypothesis is that firm size has a unit root. The Z-score yielded by the test shows that firm size has a unit root, because it falls within the acceptance interval (-3.274< -4.462) at 5% significance level. In addition, the p-value (0.2204) was more that the significance level (0.05) and hence we fail to reject the null hypothesis that firm size has a unit root and hence the data was not stationary.

Table 4: Management Efficiency

Augmented Dickey- Fuller test for unit root		Number of obs	210
		Interpolated Dickey - Fuller	
	Test Statistics	1% Critical Value	5% Critical Value	10% Critical Value
Z (t)	-5.246	-5.384	- 4.462	- 3.733
Mackinnon approximate p -value for Z (t) = 0.0081				

Source: Researchers (2021)

In this case the null hypothesis is that management efficiency has a unit root. The Z-score yielded by the test shows that management efficiency had no unit root, because it falls within the rejection region (-5.246 > - 4.462) at 5% significance level hence the data was stationary. In addition, the p-value (0.0081) was less that the significance level (0.05).

Table 5: Asset Quality

Augmented Dickey- Fuller test for unit root		Number of obs	210
		Interpolated Dickey - Fuller	
	Test Statistics	1% Critical Value	5% Critical Value	10% Critical Value
Z (t)	-5.678	-5.384	- 4.462	- 3.733
Mackinnon approximate p -value for Z (t) = 0.0068				

Source: Researchers (2021)

In this case the null hypothesis is that asset quality has a unit root. The Z-score yielded by the test shows that asset quality has no unit root, because it falls within the rejection region (-5.678 > - 4.462) at 5% significance level hence the data was stationary. In addition, the p-value (0.0068) was less that the significance level (0.05).

Table 6: Capital Adequacy

Augmented Dickey- Fuller test for unit root		Number of obs		210
		Interpolated Dickey - Fuller		
	Test Statistics	1% Critical Value	5% Critical Value	10% Critical Value
Z (t)	-5.408	-5.384	- 4.462	- 3.733
Mackinnon approximate p -value for Z (t) = 0.0071				

Source: Researchers (2021)

In this case the null hypothesis is that capital adequacy has a unit root. The Z-score yielded by the test shows that capital adequacy has no unit root, because it falls within the rejection region (-5.408 > -4.462) at 5% significance level hence the data was stationary. The p-value (0.0071) was less that the significance level (0.05).

Normality Test

Table 7: Shapiro-Wilk test for Normal Data

Variable	obs	W	V	Z	Prob > Z
ROA	210	0.92761	11.269	5.587	0
ROE	210	0.98244	2.734	2.734	0.01018
Firm Size	210	0.98262	2.706	2.296	0.01084
Management Efficiency	210	0.98801	1.867	1.44	0.07498
Asset Quality	210	0.37356	97.516	10.564	0
Capital Adequacy	210	0.6617	52.728	9.146	0

Source: Researchers (2021)

The Shapiro- Wilk test helped in determining the normality or the abnormality of the error term. The study's null hypothesis states that the population is normally distributed while the alternative is that it's not normally distributed. When making the conclusion if the p-value is lower than 0.05, then the null hypothesis will not be accepted and hence there is enough evidence to deduce that the data tested did not come from a normally distributed population. The findings show that ROA had a (p-value=0), ROE had (p-value=0.01018), firm size (p-value=0.01084), management efficiency (p-value=0.07498), asset quality (p-value=0) while capital adequacy had (p-value=0). This is an indication that all the variables used in this research had a p value of < 0.05 apart from management efficiency which had (p-value=0.07498). Therefore, the null hypothesis will not be accepted meaning that the tested data was from an abnormally distributed population apart from data on management efficiency.

Heteroscedasticity Test

Table 8: Test for Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for	**Heteroskedasticity**
Ho: Constant variance	
Variables: fitted values of Y	
chi2(1) = 0.10	
Prob > chi2 = 0.7509	

Source: Researchers (2021)

When heteroscedasticity is detected there is no effect on regression coefficient linearity and un-biasedness. Heteroscedasticity exists if the error term is not the same across the independent variable values. Heteroscedasticity has an impact on the best property of OLS, which results to hypothesis testing conclusions being invalid. The research conducted a Breusch-Pagan test to determine if heteroscedasticity existed (Gujarati, 2004). The null hypothesis is rejected when the chi value is higher than the critical value which means that there is evidence of heteroscedasticity in the model or if the p-value is smaller than 0.05, then we reject the null and hence presence of heteroscedasticity.

The outcomes show that the chi value is 0.1 which shows that there is no evidence of heteroscedasticity. Additionally, the p value at 0.7509 was higher than 0.05 which means that the study did not reject the null hypothesis homoscedasticity and thus there was no heteroscedasticity.

Autocorrelation Test

Table 9: Test for Autocorrelation

lags *(p)*	chi2	df	prob > chi2
1	5.432	1	0.0254

Source: Researchers (2021)

The Breusch–Godfrey tests for the presence of serial correlation if present, would mean that incorrect conclusions would be drawn from other tests, or that sub-optimal estimates of model parameters are obtained if it is not taken into account. The regression models to which the test can be applied include cases where lagged values of the dependent variables are used as independent variables in the model's representation for later observations. From the findings, the p-value (0.0254), which is greater than the significance level (0.05) and hence we accept the null hypothesis that no serial correlation. These findings show that there is no serial correlation among the variables.

Model Specification Test

Table 10: Testing for Fixed or Random Effects

	Coefficients			
	(b)	(B)	(b-B)	Sqrt (diag(V_b-V_B))
	fixed	random	Difference	S.E.
X1	.0014981	.0020005	-0.0005024	0.0011812
X2	-.0009897	.0009219	-0.0019117	0.0017254
X3	-.0012513	-.0006014	-0.0006499	0.0012197
X4	.0039354	.0008063	0.0031291	0.0022211

Source: Researchers (2021)

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 5.84
Prob>chi2 = 0.3651

To decide between fixed or random effects a Hausman Specification test was conducted where the null hypothesis was that the preferred model is random effects, that is if the Prob>chi2 value was greater than 0.05. The alternative the fixed effects if the Prob>chi2 value was less than 0.05. It basically tested whether the unique errors (ui) are correlated with the regressors. Since the Prob>chi2 value (0.3651) was greater than 0.05 a random effect was preferred and conducted. The findings were in agreement with Green (2008) that the null hypothesis for the test is that the random effect model is preferred to fixed effect model and is to be rejected if the p value is less than 5% to imply that fixed model is preferred.

Table 11: Testing for Random Effect

	Var	sd = sqrt(Var)
Y	.0018424	.0429229
E	.0015051	.0387955
U	.0003433	.0185293

Source: Researchers (2021)

Test: Var(u) = 0
chibar2(01) = 6.72
Prob > chibar2 = 0.0083

The Breusch-Pagan Lagrange multiplier (LM) was conducted to help decide between a random effects regression and a simple OLS regression. The null hypothesis in the LM test was that variances across entities were zero. This is, no significant difference across units (i.e. no panel effect) since the Prob>chi2 value (0.0083) was less than 0.05 we rejected the null and concluded that random effect was appropriate. The rationale behind random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. Random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. This is an assurance that the regression coefficients were stable hence valid significance tests as put by Cooper and Schindler (2011).

Correlation Analysis

Table 12: Correlation Analysis

	Y1	**Y2**	**X1**	**X2**	**X3**	**X4**
Y1	1					
Y2	-0.0328	1				
X1	0.6814	0.7053	1			
X2	0.7342	0.7442	0.8628	1		
X3	0.6482	0.5881	0.3352	0.1972	1	
X4	0.6114	0.5009	-0.6436	-0.5234	-0.5711	1

Source: Researchers (2021)

On the correlation of the study variables, the researcher conducted a Pearson correlation. From the findings on the correlation analysis between return on assets (ROA) and the independent variables, the study found that there was a strong positive correlation coefficient between ROA and firm size as depicted by the correlation coefficient of 0.6814. The above positive relationship

was due to the fact that as SACCOs grow in size, they enjoy economies of scales and thus they tend to have better performance compared to small firms. The above findings supported earlier findings by Agbeja, Olufemi and Adelakun (2015) who indicated that firm size had a positive significant linkage on bank profitability.

There was a strong positive correlation coefficient between ROA and management efficiency as indicated by the correlation coefficient of 0.7342. The findings supported the findings by Onjala (2012) who indicate that management efficiency had a positive influence on both ROA and ROE. Further, it supported Agbeja, Adelakun and Olufemi (2015) who noted that efficiency was found to significantly affect bank profitability. Kariuki and Wafula (2016) also noted that there was a positive significant impact of management efficiency on Sacco's performance.

There was a strong positive correlation coefficient between ROA and asset quality as indicated by the correlation coefficient of 0.6482. The findings supported Okumu and Oyugi (2016) findings who exhibited a positive and significant relationship between asset quality and SACCO performance. The findings differed with Agbeja et al. (2015) findings that quality of asset had an inverse significant impact on bank's profitability.

There was a strong positive correlation coefficient between ROA and capital adequacy as indicated by the correlation coefficient of 0.6114. The findings supported Njoroge (2016) findings that that adequacy of capital had a significant influence on SACCOs' performance. Regarding the correlation between return on equity (ROE) and the independent variables, the study found that there was a strong positive correlation coefficient between ROE and firm size as depicted by the correlation coefficient of 0.7053. The results supported Kariuki and Wafula (2016) who indicated a significant positive effect of firm size on SACCOs' performance.

There was a strong positive correlation coefficient between ROE and management efficiency as indicated by the correlation coefficient of 0.7442. The findings supported Ochingo and Muturi (2018) who established that management efficiency of SACCOs had significant positive consequence on Sacco's performance. Also, Fujo and Ali (2016) who depicted that efficiency of management have a positive significant impact on performance among SACCOs in Kilifi. This is because management was efficient on financial innovation, credit management and working capital management.

There was a strong positive correlation coefficient between ROE and asset quality as indicated by the correlation coefficient of 0.5881. The findings supported Umoru and Osemwegie (2016) results that the quality of asset significantly influenced performance of commercial bank. The findings differed with Kariuki, Ngugi and Muturi (2016) results that there was a significant inverse connection between quality of asset and efficiency of Kenyan SACCOs and the performance.

Finally, there was a strong positive correlation coefficient between ROE and capital adequacy as indicated by the correlation coefficient of 0.5009. The findings were in the support of Fujo and Ali (2016) findings that capital adequacy is key in determining performance among SACCOs in Kilifi. There was also support of Kariuki and Wafula (2016) findings that capital adequacy was found to significantly determine the performance of SACCOs.

Table 13: Regression Analysis

Regression Analysis

```
Random-effects GLS regression                   Number of obs      =       210
Group variable: number                          Number of groups   =        42

R-sq:  within  = 0.3105                         Obs per group: min =         5
       between = 0.4969                                        avg =       5.0
       overall = 0.2392                                        max =         5

                                                Wald chi2(4)       =     63.98
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =   0.04085

------------------------------------------------------------------------------
           Y |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          X1 |   .1020005   .0127720     7.99  0.004    -1.105028    .1345037
          X2 |   .2009219   .0191181    10.51  0.000    -1.0008651   .8027091
          X3 |   .5006014   .0610003     8.21  0.000    -.7025619    .4013591
          X4 |   .4008063   .0529632     7.57  0.006    -.4081528    .2026946
       _cons |  3.0186901   .2215623    13.62  0.000    -6.0235712   11.060951
-------------+----------------------------------------------------------------
     sigma_u |  3.01852927
     sigma_e |  6.03879552
         rho |  .28574392   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Source: Researchers (2021)

From table 13, the model showed a significant Wald chi2 of 63.98 while the random model fitted showed that the significant value was 0.041 which was less than 0.05. This shows that firm size, management efficiency, asset quality and capital adequacy had a significant combined impact on return on asset. The random impact model is a between regressor model hence the interpretation was based on the R squared between the variables.

The data showed an R squared value (between) of 0.4969. This shows that 49.69% of the change in return on asset was due to changes in firm size, management efficiency, asset quality and capital adequacy at 95% confidence interval. The remaining 51.31% change in return on asset was accounted by other factors other than firm size, management efficiency, asset quality and capital adequacy.

From the data in the above table the established regression equation was

$Y_1 = 3.019 + 0.102X_1 + 0.2009X_2 + 0.5006X_3 + 0.4008X_4$

From the above regression equation, it was uncovered that firm size, management efficiency, asset quality and capital adequacy held to a constant zero, return on assets would be at 3.019 while a unit increment in firm size would lead to an increment in return on assets by 0.102 units. A unit increment in management efficiency would lead to increase in return on assets by 0.2009 units, a unit increment in asset quality would lead to an increment in return on assets by 0.5006 units while a unit increase in capital adequacy would lead to increase in return on assets by 0.4008 units.

Discussion of Findings

There was a significant relationship between firm size and performance as measured by return on assets. Also the results by Barus, Kibati and Muturi (2017) who depicted a significant positive connection between size and performance. There was a significant relationship between

management efficiency and performance as measured by return on assets. The findings are supported Ochingo and Muturi (2018) who established that management efficiency of SACCOs had significant positive consequence on Sacco's performance. This paper findings differed with those of Barus et al. (2018) who focused on the effect of management efficiency on financial performance of savings and credit societies in Kenya and concluded that management efficiency has no significant influence on the financial performance of savings and credit societies in Kenya.

There was a significant relationship between asset quality and performance as measured by return on assets. The findings differed with Kariuki, Ngugi and Muturi (2016) results that there was a significant inverse connection between quality of asset and efficiency of Kenyan SACCOs and the performance. The results further supported Cheruiyot (2016) findings that there is a great positive relationship between asset quality and profitability of Commercial Banks in Kenya. This is because when the ratio of Non-performing asset to net assets is low, it means that the trade-off between assets quality and profitability is positive.

There was a significant relationship between asset quality and performance as measured by return on assets. The findings were similar to those of Barus et al., (2017) who examined the effect of capital adequacy and performance of savings and credit cooperative societies in Kenya and found that capital adequacy significantly affects firm performance. There was also support of Kariuki and Wafula (2016) findings that capital adequacy was found to significantly determine the performance of SACCOs. Further, Otwani, Namusonge and Nambuswa (2017) who established that capital adequacy was found to significantly and positively influence financial performance of companies listed on the NSE in Kenya to a very high extend. Thus it is paramount for companies to have a sound capital base in order to remain competitive and maintain the confidence of its customers.

Conclusions

It is concluded that firm size has a positive effect on financial performance of the SACCOs since as the SACCOs grow in size, they enjoy economies of scales and thus they tend to have better performance compared to small firms. Large SACCOs enjoy greater branch networks which provide proximity convenience that may result in higher deposits. However, if economies of scale are not exploited this may impact negatively on financial performance.

Management efficiency has a positive effect on financial performance of the SACCOs. This is because efficiency has become an essential emphasis in today's highly competitive business environment since management efficiency enhances better customer satisfaction and thus improved sales and in turn better financial performance.

Asset quality has a positive effect on financial performance of the SACCOs. Asset quality determines the performance of any SACCO because it increases interest income and reduces the cost burden of bad debt management at the same time.

Capital adequacy has a positive effect on financial performance of the SACCOs. Capital adequacy determines the capacity of a SACCO in terms of meeting the time liabilities and other risks such as credit risk, operational risk, etc. It also helps cushion the SACCO against potential losses and hence protects the interests of the SACCO's depositors and other lenders and this in turn enhance their financial performance.

Recommendations

The small sized SACCOs should consider merging with other SACCOs so as to increase their size and in return increase their asset base. This is because large SACCOs enjoy greater branch

networks and economies of scale and hence they are able to have a competitive advantage over their competitors which in turn enhance their financial performance.

The managers and other employers should be trained on how to manage the SACCOs so as to enhance their efficiency and effectiveness. This will in return ensure that the quality services are offered and hence customer satisfaction and an increase in the customer base.

The management of the SACCOs should evaluate the quality of assets they intend to use in the daily operation of the SACCOs. This is because asset quality increases interest income and reduces the cost burden of bad debt management at the same time and thus enhance financial performance.

The SACCOs should ensure that they have adequate capital to ensure that they can meet their prime function which is lending. This will inturn increase their interest income and hence their financial performance.

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