Capital Adequacy Requirements and Capital Efficiency of Deposit-Taking SACCOs (DTSs)

Monica Chepkirui[1*], Kennedy M. Waweru[2] and Wycliffe Oboka[3]
[1*]The Co-operative University of Kenya, Corresponding author: mchepkirui@cuk.ac.ke
[2]The Co-operative University of Kenya, kwaweru@cuk.ac.ke
[3]The Co-operative University of Kenya, woboka@cuk.ac.ke

Abstract
In recent years, more stringent regulations governing Savings and Credit Co-operatives (SACCOs) have been adopted. One such regulation is capping of capital adequacy requirements which compel Deposit-Taking SACCOs (DTSs) to maintain a minimum of Ksh. 10 million of members' deposit as core capital to cushion against losses that may result from operational risks. A key objective of this regulation is to enhance resilience of SACCOs to these risks. And while regulators pursue resilience, this often comes at a cost to efficiency. We undertook a study to examine the impact of the capital adequacy requirement on the efficiency of SACCO operations. In the study, we investigated the relationship between capital adequacy requirements and capital efficiency of DTSs. Adopting a positivism research philosophy and a correlational research design; we employed regression analysis to determine the relationship between capital adequacy requirements and the capital efficiency of DTSs. We measured the level of capital efficiency of each SACCO using Data Envelopment Analysis (DEA). The study found DTSs capital efficiency to have a negative but not significant relationship with core capital. DTSs meeting the core capital of Ksh. 10M and more did not enjoy better efficiency compared to those not meeting the prescribed threshold despite not being significant. The findings imply that achieving compliance is negatively affecting the capital efficiency of DTSs. Imposing of strict regulations on DTSs hinders their ability to use inputs in optimal proportions to allocate their scarce resources resulting in lower returns. Furthermore, DTSs having a core capital of Ksh.10 Million and more have excess liquidity funds than they should hold. Holding of these idle funds may imply inefficient utilization of resources by the DTSs. We recommend that the regulator re-examine the capital adequacy requirements with the goal of establishing the most optimal levels that guarantees safety of members deposits and resilience of the SACCOs while optimizing on efficiency.

Keywords: Capital adequacy requirements, Capital efficiency, Deposit-Taking SACCOs
AJCDT, Vol. 6 No. 2 (December, 2021), pp. 73 – 80, *© 2021 The Co-operative University of Kenya*

INTRODUCTION

In the recent years, co-operatives have gained acceptance as critical part of socio-economic development all over the world (Financial Sector Deepening Kenya, 2015). Savings and Credit Co-operative Societies (SACCOs) have emerged as one of the rapidly growing sector of co-operatives. Although it has not gained much recognition in the developed world, in third world countries, SACCOs have proven to be key pillars of national economic growth and household empowerment (Economic Survey, 2018).

Kenya boasts a long history of co-operative growth that has impacted positively to the general economic wellbeing. The government has recognized the vital role the sector plays in mobilization of internal

savings, accounting for over 43% of Kenya's Gross Domestic Product (GDP) (Economic Survey, 2018). As a result, the Kenyan co-operative sector has been ranked among the best performers in Africa and in the world with a total of $6.7 trillion in saving and shares; $7.9 trillion in loans; $10 trillion in assets; and, 27.86% penetration (WOCCU, 2019). As is the case with general cooperative sector, the SACCO sector has developed significantly, making the SACCOs to evolve as a vital part of Kenya's financial system. The SACCO sector comprises both Deposit Taking and non-Deposit Taking SACCOs. Deposit Taking SACCOs (DTSs) are licensed and regulated by Sacco Societies Regulatory Authority (SASRA) while non- Deposit Taking SACCOs are supervised by the Commissioner for Co-operatives. The continued growth and influence of the SACCO sector on the financial and monetary systems over the years, came with several challenges which could not be sufficiently addressed within the provision of Co-operative Societies Act (SASRA, 2010).

Owing to this development coupled with governance constraints in the conduct of the SACCO operations, there was a need to develop an appropriate legislation to regulate and supervise financial co-operatives. This created a new way of monitoring and controlling their operations in response to this challenge hence there was a need for a legislation specific to the SACCO sector. A closer look indicates that the sectors' unique operating principles could not be effectively covered by the usual commercial banking regulatory framework leading to drafting of a SACCO specific legislation, SACCO Societies Act 2008(SASRA, 2010). With the enactment of the Act, all DTSs have, therefore, been brought under regulation and supervision. The implementation of SACCO Regulation Act 2008 and the formation of SASRA led to the introduction of prudential regulations for all DTSs. The underlying aspect of regulation of the financial sector is capital requirement. It received more prominence following the financial crisis of 2007-2009 (Financial Service Authority, 2009). As a result, setting capital requirements became a major policy issue for regulators across the world. SACCOs, like any other business organizations, face a variety of risks that pose negative threats to their operations. It is important that SACCOs are well capitalized to ensure that they overcome local and global turbulences.

Motivated by ensuring stability in the SACCOs, SASRA issued prudential guidelines which govern the minimum capital requirements for DTSs. DTSs were required to hold adequate levels of capital to safeguard member deposits and creditors from losses arising from corporate risks that the SACCO may face. The regulations set by SASRA in 2010 required deposit-taking SACCOs to hold a core capital amounting to or more than Ksh. 10 million; recommended capital adequacy ratios of core capital to total assets at ten percent (10%); core capital to total deposits at eight percent (8%); and, institutional capital to total assets at eight percent (8%) (SASRA, 2010). Pursuant to the implementation of SACCO Regulation Act 2008 and the formation of SASRA, it was mandated to promote and maintain the safety, soundness and integrity the SACCO sector (SASRA, 2010). On its part, SASRA continued to support reforms outlined in the Act. In this regard, it is important that DTSs are well capitalized to provide a buffer from the business risks they may face in the changing economic environment. While capitalization of SACCOs is of great significance, its influence on efficiency to mobilize resources required to maximize on the members' welfare and sustaining the growth momentum of the sector needs to be investigated. The study evaluates the impact of this requirement on the efficiency of SACCO operations. In particular, this paper (1) evaluates the capital efficiency of Deposit-Taking SACCOs in Kenya; and, (2) determines whether a relationship exists between capital adequacy requirements and capital efficiency of DTSs in Kenya.

Literature Review: Calem & Rob, 1996 in the capital buffer theory, argues that

regulators should encourage banks to hold extra capital levels to lower the likelihood of falling beneath the stipulated regulatory limit. They pointed out that the behavior of banks relies upon the capital size they hold: banks holding high capital levels will seek to maintain their capital levels while banks holding low capital levels will focus on increasing their capital levels. The classical version of the theory is based on a call for banks to hold capital that exceeds the regulatory minimum requirement. A common explanation for this has been that excess capital acts as a buffer over the regulatory minimum. Banks have an incentive to hold such a buffer because capital adjustments in response to fluctuations in their capital ratios are costly, so they want to avoid being close to the minimum regulatory constraint. The theory of capital buffer theory gives light to the global major policy issue towards regulation.

Ordinarily, it is expected that SACCOs in their quest to safeguard member deposits and creditors from business risks; and building a resilient SACCO sector, they would be expected to have adequate capitalization capable of withstanding external shocks in times of crisis. Efficiency is a key concept for financial institutions. The concept of efficiency has gained prominence as an alternative measure of the firms' performance (Mirie, 2014). In the long term, the Data Envelopment Analysis (DEA) technique created by (Charnes et al., 1978) has progressively become the favored methodology for efficiency measurement. DEA is founded on a yield ratio index quantified by the ratio of weighted outputs to weighted inputs. Given the financial intermediary role performed by DTSs, total deposits; external borrowing; and operating expense were used as inputs while net income after tax; total assets; and total loans excluding assets were used as the outputs.

The focus on the inputs and outputs was based on the appreciation of the studies that adopted this method. Studies that adapted the same method in analyzing efficiency in financial institutions include (Biwott & Nyakang'o, 2017, Njoroge, 2013, Nand & Singh, 2014), and (Tesfay, 2016). On the relationship between capital adequacy requirements and efficiency, multiple regression has been widely used Pessarossi & Weill (2013) suggests that capital requirements strengthen financial stability of commercial banks by providing a larger capital buffer. Additionally, it improves the efficiency of banks by lessening moral hazard among shareholders and creditors. Therefore, efficiency of banks increased in relation to capital ratio. Thus, prudential regulation on capital requirements increases the stability and efficiency of the financial sector. Lawal et al. (2018) studied the impact of capital adequacy on the operational efficiency of Nigerian banks. Findings indicated that banks are required to meet the minimum capital base at all time to be able to perform its statutory role of financial intermediation and remain financially stable to withstand both internal and external shocks within the financial system. This will only be realized if the banks will seriously take into consideration the regulatory compliance guidelines issued by the regulatory agencies so as to promote sound financial system. (Lotto, 2018) examined the impact of statutory regulatory requirements on banks' operational efficiency in Tanzania.

The findings indicated that the banks which were subjected to more stringent capital regulations proved to be more efficient. Furthermore, this relationship suggests that capital adequacy strengthen financial stability by providing a larger capital cushion and also improves the operating efficiency of banks. This study confirmed the findings of Pessarossi & Weill (2013) that there is a positive and significant effect among the capital requirements and bank efficiency. Murkomen (2016) studied the influence of capital regulatory requirements on operational efficiency of commercial banks in Kenya. This was through examining a census study of all the 41 commercial banks and analysis incorporated a fixed impacts regression model. From the findings, capital adequacy

requirement is positively related to the operational efficiency. She pointed out that high efficiency of banks is majorly associated with the core capital levels. Therefore, banks are required to build their capital levels and specifically on core capital levels in order to improve their operational efficiency.

RESEARCH METHODOLOGY

The target population of the study comprised of all DTSs in Kenya between 2014 and 2018. As such, a census sampling technique was employed since regulation is an issue affecting all DTSs in Kenya. A correlation research design was employed. Secondary data was collected from SASRA supervisory reports over the target period. DEA was used to evaluate the efficiency of DTSs while regression analysis was further utilized to determine the relationship between capital adequacy requirements and the capital efficiency of DTSs. This study did a Breusch-Pagan test to guard against heteroscedasticity. Normality tests including Q-Q plots and a visual histogram were done to confirm sample was from a population with a normal distribution (Razali, & Wah, 2011). The study used variance inflation factor and tolerance tests to assure absence of multicollinearity (Gujarati, 2003). Data envelopment analysis (DEA) was used to measure efficiency of DTSs using equations (i) and (ii)

$$E_I = Maximize \sum_{k=1}^{O} U_k Y_{ki} / \sum_{j=1}^{i} V_j X_{ji} \quad (i)$$

Subject to:

$$E_I = Maximize \sum_{k=1}^{O} U_k Y_{ki} / \sum_{j=1}^{i} V_j X_{ji} \leq 1, j = 1, \ldots n \; and \; V_j \text{and } U_k \geq 0 \quad (ii)$$

Where:

O = number of outputs for deposit taking SACCOs using i different inputs;

i = number of inputs used by each deposit taking SACCOs to produce o different outputs;

y_{ki} = is the amount of the k^{th} output for the i^{th} deposit taking SACCOs;

x_{ji} = is the amount of the j^{th} input used by the i^{th} deposit taking SACCOs;

u_k = is the output weight;

v_j = is the input weight,

On the other hand, multiple linear regression was used to investigate the relationship between capital adequacy requirements and capital efficiency of DTSs. The model was fitted combining all the capital adequacy requirements (core capital, core capital to total assets, core capital to total deposits and institutional capital to total assets) to facilitate this analysis. A dummy variable was included to investigate the effect of core capital compliance on efficiency. We use equation (iii):

$$E_{it} = \alpha_{it} + \beta_1 D_{it} + \beta_2 C1_{it} + \beta_3 C2_{it} + \beta_4 C3_{it} + \beta_5 C4_{it} + \varepsilon_{it} \quad (iii)$$

Where:

E_{it}= Efficiency of DTSs (i) at time (t) (Where, 0<= ε_i <=1);

α_i = Intercept, a sample-wide constant

β = coefficients for the respective determinants

C_1 = core capital

C_2 = core capital to total asset ratio

C_3 = core capital to total deposit ratio

C_4=institutional capital to total deposit ratio

ε_i = error term

RESULTS

The mean efficiency of 51.31% (Table 1) indicates that the DTSs were doing fairly well in complying with the prudential regulations set by SASRA. However, their standard deviations of 19.64% was low implying that the level of efficiency was close from one DTS to the other. Core capital (CC) had a mean of Ksh. 3.41 billion with a standard deviation of Ksh. 6.9 billion indicating that

the level of compliance with prudential regulations was spread from each other over the years. Core capital to total assets (CC/TA), core capital to total deposits (CC/TD) and institutional capital to total assets (IC/TA) had a mean of 16.06, 25.77, and 8.28 per cent respectively. DTSs are required to maintain capital adequacy ratios of CC/TA, CC/TD and IC/TA of 10%, 8% and 8% respectively. Therefore, over the period of study DTSs were maintaining the capital adequacy ratios as required by the regulator. The findings of the study also showed that some DTSs reported negative capital adequacy ratios (M = -0.2662, -0.4787 and -0.322) an indication that some DTSs were financing their operations through deposit liabilities.

Table 1: Summary Descriptive Statistics of Study Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Efficiency	857	0.5131	0.1964	0.0203	1
CC (Ksh. Billions)	857	3.41	0.69	0	0.061
CC/TA	857	0.1606	0.094	-0.2662	0.7849
CC/TD	857	0.2577	0.2446	-0.4787	3.778
IC/TA	857	0.0828	0.0887	-0.322	0.6623

We conducted various diagnostic tests. Q-Q plot was used to establish if a data set is normally distributed. The visuals provided that the data were normally distributed. For test against autocorrelation, a Durbin-Watson statistic of 1.090 was obtained. This outcome is not close to prescribed value of two, indicating that there is serial correlation in the residuals of the model. A generalized least squares (GLS) was therefore adopted to correct the violations of the assumptions of non-serial correlation. The transformed DW statistics is slightly above 2 (d=2.08). The transformed residuals did not lead to much deviation in results. This means that despite adopting the GLS model to correct the violations, the autocorrelation problem was not completely eliminated. Results of Breusch-Pagan / Cook-Weisberg shows that the Lagrange multiplier constant variance (Chi-square= 2.09) is not statistically significant (P = 0.1486). Thus, fail to reject the null hypothesis and conclude that the error variance is equal thus, heteroscedasticity is absent. For the sample: Variance Inflation Factor (VIF) range between 1.31 and 8.74. The values range of 1 to 10 therefore meet the conditions of multicollinearity (Gujarati, 2003) showing that there were no significant correlations among the predictors of the model.

Capital Efficiency of DTSs in Kenya: Table 2 is a model summary of frequency distribution for DTSs. Capital efficiency in this case was measured using DEA model as the ratio of weighted outputs to weighted inputs. Effectively, total deposits; operating expenses; and external borrowing were selected as inputs while total assets; total loans; and net income after tax were selected as outputs of the study. As it can be seen from table, the efficiency is moderately distributed with the mean of 0.51 efficiency level, with a standard deviation of 0.15. With an average efficiency score of 0.51, it means that these particular DTSs ought to decrease their inputs by 49% so as to attain 100 percent efficiency. The DTS with the lowest efficiency of 0.22 has an improvement gap of 0.78 points.

Table 2: Efficiency Frequency Distribution

Class	**Freq.**	**%**
Upto 0.3	13	7.47
.3000-.3999	41	23.56
.4000-.4999	38	21.84
.5000-.5999	30	17.74
.6000-.6999	31	17.82
.7000-.7999	15	8.62
.8000-.8999	5	2.87
Above 0.9	1	0.57
N	**174**	**100**
Max = 1 Min = 0.2204 Mean = 0.5057	Skewness = 0.2283 Kurtosis = -0.6038 Std. Dev. = 0.1571	

Relationship between Capital Adequacy Requirements and Efficiency of DTSs: Table 3 is a model summary of a regression run for efficiency on capital adequacy requirements for DTSs. From the summary of the model, the study observed a positive correlation R of 0.3506 and R^2 at 0.1229. An adjusted model can explain about 11.78% of the variations in level of efficiency in DTSs, given that adjusted R^2 =.1178.

Table 3: Model Summary for Regression of Efficiency on Capital Adequacy requirements

Model Summary				
Model	R	R squared	Adjusted R square	Std. Error of the Estimate
ii	0.3506	0.1229	0.1178	0.0408

a. Predictors: (constant), core capital dummy, CC, CC/TA, CC/TD, IC/TA

Table 4 is an output of the analysis of variance (ANOVA) and t-test of the coefficients of a regression run of efficiency on capital adequacy requirements. The results of regression of efficiency on capital adequacy requirements reveal a significant regression equation (F (5,851) =23.85, p=0.000. Core capital (β1= 0.00, p-value < 0.05), core capital to total assets (β1= -0.49, p-value < 0.05), core capital to total deposits (β1= 0.19, p-value < 0.05) and institutional capital to total assets (β1= 0.66, p-value < 0.05) were found to have a significant relationship with the efficiency of DTSs at 5% significance level. However, a negative relationship between core capital to total assets and efficiency of DTSs was found despite being statistically significant.

Lastly, core capital dummy had a negative co-efficient of -0.004 with a p value of 0.928 which is greater than our significance level of 0.05. This indicates that core capital dummy had a negative but not significant relationship between capital adequacy requirements and efficiency of DTSs.

Table 4: ANOVA and t-tests Coefficients Output for Regression of efficiency on capital adequacy requirements

Anova

Source	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4.0597	5	0.8119	23.85	0
Residual	28.9682	851	0.0340		
Total	33.0279	856			

	Unstandardized Coefficients		Standardized Coefficients		
Variable	B	Std. Error	Beta	T	Sig.
(Constant)	0.4767	0.0408	0.3966	11.68	0.000
CC (Ksh. Trillion)	0.0000	9.38	2.75	4.9	0.000
CC/TA	-0.4909	0.1567	-0.7986	-3.13	0.002
CC/TD	0.1889	0.0465	0.0977	4.07	0.000
IC/TA	0.6638	0.1131	0.4420	5.87	0.000
Core capital dummy	-0.0041	0.0448	-0.0919	-0.09	0.928

a) Dependent Variable: Efficiency.

b) Predictors: (constant), core capital dummy, CC, CC/TA, CC/TD, IC/TA

DISCUSSION

The objective of this paper was to determine the relationship between capital adequacy requirements and capital efficiency of DTSs. Two major patterns were found: (i) the relationship between core capital to total assets and efficiency of DTSs was established to be negative and significant. This meant that DTSs that were maintaining core capital to total assets ratio greater than 10% on average were 4.9% (p< 0.000) less efficient than their non-compliant counterparts; and (ii) core capital dummy was found to have a negative but not significant relationship effect on this relationship. Despite being not significant,

DTSs that achieved compliance by maintaining a core capital of Ksh.10M and more were 0.04 less efficient compared to those DTSs not meeting the prescribed threshold of Ksh.10M holding other variables constant. This implies that achieving compliance by maintaining a core capital of Ksh.10M and above does not improve the efficiency of DTSs. Additionally, DTSs having a core capital of Ksh.10 Million and above have excess capital levels than they should hold. DTSs on average already hold capital levels excess of the minimum requirement. Holding of these idle funds and simultaneously imposing the capital adequacy requirements could raise questions on the financial implication as to the efficiency of DTSs. First, the use of strict capital regulations on DTSs hinders their ability to use inputs in optimal proportions to allocate their scarce inputs in situations that could generate higher returns. Stringent regulations come with a cost on the economy as DTSs will try to pass on to their members the higher cost of funding.

According to Caggian & Calice (2011), the subsequent cost would decrease the degree of utilization and interest in the economy. This, would therefore, result to lower returns. Secondly, holding too much cash may imply inefficient utilization of resources. Excess liquidity results to idle resources with no returns and increases costs of retaining it in DTSs. This undermines the efficiency of DTSs by not availing funds necessary for efficient service provision of the sector. In conclusion, the benefits associated with high capital and liquidity requirements could be minimal. SASRA issued prudential guidelines with the intention to safeguard member deposits and creditors from losses arising from corporate risks that the DTSs may face. However, achieving compliance could be counterproductive and lowers the efficiency of DTSs.

CONCLUSION AND RECOMMENDATION

We conclude that there is a negative significant relationship between core capital and efficiency of DTSs in Kenya, and that core capital dummy has a negative but not significant relationship between capital adequacy requirements and efficiency.

Therefore, DTSs in Kenya could enhance their efficiency if the regulator will review capital adequacy requirements imposed on them. DTSs which are non-compliant to the stipulated requirements are bound to be more efficient than those who are subject to strict capital adequacy requirements.

We recommend that the regulator re-examine the capital adequacy requirements with the goal of establishing the most optimal levels that guarantees safety of members' deposits and resilience of the SACCOs while optimizing on efficiency.

REFERENCES

Biwott, M. K., & Nyakang'o, E. O. (2017). Efficiency and Productivity of Deposit Taking Cooperatives in a regulatory transition: Evidence from Kenya. *International Journal of Economics, Commerce and Management*, *5*(11), 436–447.

Caggian, G., & Calice, P. (2011). *The Macroeconomic Impact of Higher Capital Ratios on African Economies* [Working Paper Series N° 139, African Development Bank,].

Calem, Paul. S., & Rob, R. (1996). "The Impact of Capital-Based Regulation on Bank Risk-Taking: A Dynamic Model. *Finance and Economics Discussion Series 96/12 (February), 36*.

Economic Survey (Kenya National Bureau of Statistics). (2018).

Financial Sector Deepening. (2015). *Financial Sector Deepening* (FSD). [Annual Report].

Lawal, T. T., Muturi, W., & Oluoch, O. (2018). Capital Adequacy and Bank's Operating Efficiency in the Nigerian Banking industry. International Journal of Management and Commerce Innovations, 6(1), 412–418.ujarati, D. N. (2003). *Basic Econometrics* (4th ed.). McGraw−Hill.

Lotto, J. (2018). The Empirical Analysis of the Impact of Bank Capital Regulations on Operating Efficiency. *International Journal of Financial Studies*, *34*(6).

Mirie, M. (2014). The Influence of Members' Income and Conduct of SACCOs in the Relationship between Characteristics and Efficiency of SACCOs in Kenya. *University of Nairobi.*

Murkomen, R. J. (2016). *The effects of capital requirements on operating efficiency of commercial banks in Kenya*.

Nand, K., & Singh, A. (2014). Technical efficiency of commercial banks in India. *IOSR Journal of Business and Management*, *16*(9), 37–43.

Njoroge, M. G. (2013). Determinants of efficiency of Savings and Credit Co-operative societies in Nairobi County. *University of Nairobi Unpublished MBA Thesis*.

Pessarossi, P., & Weill, L. (2013). The relation between capital ratio and bank efficiency for Chinese banks over the period 2004−2009. *Institute for Economies in Transition Bank of Finland*.

Razali, N. M., & Wah, Y. B. (2011). Power comparisons of shapiro-wilk, kolmogorov-smirnov, lilliefors and anderson-darling tests. *Journal of Statistical Modeling and Analytics, 2*(1), 21–33.

SACCO Societies Regulatory Authority. (2010). *SACCO Supervision Annual Report-2010* [An annual report on the operations and performance of Deposit-Taking Sacco Societies (DT-SACCOs) in Kenya].

Tesfay, T. (2016). Determinants of commercial banks efficiency: Evidence from Selected Commercial Banks of Ethiopia. *International Journal of Scientific and Research Publications*, *6*(5).

World Council of Credit Unions. (2019). *The Global Network of Credit Unions and Financial Cooperatives* [2017 Statistical Report].