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The Moderating Effect of SACCO Size on the Relationship Between Prudential Regulations and Financial Performance of Deposit-Taking SACCOs in Kenya.

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Abstract
This study investigated the moderating effect of SACCO size on the relationship between prudential regulations and the financial performance of Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Kenya. Prudential regulations, including liquidity, capital adequacy, credit, and investment requirements, are critical for maintaining financial stability and safeguarding depositor funds. Using a fixed effects moderation model, the study analyzes panel data from 175 SACCOs spanning five years (2015–2019). SACCO size, measured by total assets, serves as the moderating variable. The findings reveal that SACCO size significantly moderates the relationship between credit and investment regulations and financial performance. Larger SACCOs benefit from greater resources and operational capacity, allowing them to effectively implement investment regulations and achieve enhanced financial outcomes. However, SACCO size negatively moderates the relationship between credit regulation and financial performance, indicating challenges for larger SACCOs in managing credit risks. Conversely, no statistically significant moderating effect of SACCO size was observed for liquidity and capital regulations, suggesting these regulations uniformly impact SACCOs regardless of size. Future research could explore additional factors, such as governance structures, that may interact with SACCO size to influence financial outcomes.
Keywords: *Prudential Regulations, Financial Performance, SACCOs Size.*
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Introduction

Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Kenya are a cornerstone of the financial sector, promoting financial inclusion and fostering socio-economic growth. These institutions provide affordable credit, mobilize savings, and enhance access to financial services for individuals and small businesses, particularly in underserved communities (Kimathi, 2014). SACCOs contribute significantly to Kenya's economic development agenda, including Vision 2030 through finance access (Mwangi, 2016). However, the financial stability and performance of DT-SACCOs are often challenged by systemic risks, operational inefficiencies, and regulatory compliance issues, necessitating the enforcement of prudential regulations (Barus et al., 2017).

Prudential regulations aim to safeguard the financial health of SACCOs by setting minimum standards for liquidity, capital adequacy, credit risk management, and investment practices. These regulations are designed to ensure that SACCOs maintain sufficient liquidity to meet short-term obligations, adequate capital buffers to absorb financial shocks, prudent credit policies to minimize loan defaults, and sound investment strategies to optimize returns (Mudibo, 2015). Compliance with these regulations is critical for the sustainability and performance of SACCOs, as they mitigate risks and enhance depositor confidence (Gatu et al., 2023). However, the impact of these regulations on financial performance is not uniform and may be influenced by the size of the SACCO.

SACCO size, measured by membership, and deposit levels, is a significant determinant of a SACCO's operational capacity and resilience to regulatory demands (Githire et al., 2015). Larger SACCOs, with greater financial and human resources, are often better equipped to comply with regulatory requirements, absorb compliance costs, and leverage economies of scale for improved performance (Githaka, Kimani & Gachora, 2017). These SACCOs can also diversify their investment portfolios and implement advanced risk management practices, thereby maximizing the benefits of prudential regulations (Muli, 2017). Conversely, smaller SACCOs may face resource constraints that limit their ability to meet regulatory thresholds, such as capital adequacy and credit risk management requirements, potentially impacting their financial performance negatively (Mwaniki, 2018). Therefore this study sort to investigate SACCO size moderating effects on the relationship between prudential regulations and financial performance.

Problem Statement

The financial performance of Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Kenya is heavily influenced by prudential regulations, which aim to promote financial stability, safeguard depositor funds, and enhance operational efficiency. These regulations encompass liquidity requirements, capital adequacy, credit risk management, and investment guidelines, all of which are essential for ensuring institutional resilience and sustainability (Mudibo, 2015). However, despite the critical role of prudential regulations, many SACCOs struggle to achieve consistent financial performance due to compliance challenges and operational inefficiencies (SASRA Report, 2020).

Empirical studies have highlighted mixed findings on the relationship between prudential regulations and financial performance in SACCOs. While some studies emphasize the positive impact of liquidity and capital regulations on financial stability (Barus et al., 2017; Muli, 2017), others identify challenges, particularly for smaller financial institutions, in achieving compliance with credit and investment regulations (Makori et al., 2015; Mutemi & Makori, 2019). These variations suggest that SACCO size may play a moderating role in the effectiveness of prudential regulations, influencing their impact on financial performance. However, there remains a significant knowledge gap regarding the moderating role of SACCO size in the relationship between prudential regulations and financial performance. Demonstrating this interaction is crucial for designing tailored regulatory frameworks that account for the unique capacities of SACCOs of varying sizes. This article investigated the moderating effect of SACCO size on the relationship between prudential regulations and financial performance of DT-SACCOs in Kenya.

Literature Review

The influence of prudential regulations on the financial performance of Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) is underpinned by several theoretical frameworks that provide insights into the mechanisms and implications of regulatory compliance. This section discusses the theoretical foundations of the study, focusing on the Liquidity Preference Theory, Buffer Theory of Capital Adequacy, and the 5Cs Model of Credit Appraisal.

Liquidity Preference Theory

The Liquidity Preference Theory, developed by Keynes (1936), posits that financial institutions prioritize holding liquid assets to meet short-term obligations and capitalize on unforeseen opportunities. Liquidity regulations, such as cash reserve ratios and loan-to-deposit ratios, are grounded in this theory as they require financial institutions, including SACCOs, to maintain sufficient liquid assets to ensure operational stability and avoid liquidity crises (Kimathi, 2014). In the context of SACCOs, compliance with liquidity regulations enhances depositor confidence and reduces the risk of financial distress, thereby positively influencing financial performance. Empirical studies support this theoretical perspective, with findings indicating that SACCOs with robust liquidity management practices are better able to meet member demands and maintain financial stability (Githaka, Kimani & Gachora, 2017). However, the theory also highlights a potential trade-off between liquidity and profitability, as maintaining high liquidity levels may limit the funds available for income-generating activities. This trade-off is particularly challenging for smaller SACCOs, which often have limited resources to balance regulatory compliance with operational efficiency (Mwaniki, 2018).

Buffer Theory of Capital Adequacy

The Buffer Theory of Capital Adequacy, advanced by Calem and Rob (1996), emphasizes the importance of maintaining sufficient capital buffers to absorb financial shocks and ensure institutional resilience. According to this theory, financial institutions that operate close to regulatory minimum capital levels are incentivized to adopt risk-averse strategies and build additional buffers to mitigate potential losses (Githire et al., 2015). For SACCOs, capital adequacy regulations, such as maintaining core capital ratios and institutional reserves, are critical for ensuring financial stability and protecting depositor funds. This theory is particularly relevant for understanding how SACCO size interacts with capital regulations. Larger SACCOs are often better equipped to meet capital adequacy requirements due to their access to diverse funding sources and economies of scale (Okeyo et al., 2023). In contrast, smaller SACCOs may struggle to achieve these thresholds, limiting their ability to expand services and enhance profitability. Empirical evidence suggests that well-capitalized SACCOs experience improved financial performance, as they are better positioned to withstand economic fluctuations and leverage growth opportunities (Barus et al., 2017).

5Cs Model of Credit Appraisal

The 5Cs Model of Credit Appraisal, developed by Myers and Forgy (2005), provides a framework for assessing borrower creditworthiness based on five key attributes: Character, Capacity, Collateral, Capital, and Conditions. This model is integral to credit regulation practices, which aim to minimize the risk of non-performing loans and ensure prudent lending practices. In the context of SACCOs, adherence to credit regulations and effective borrower appraisal processes enhance loan recovery rates and financial performance (Sharma, 2011). The model underscores the challenges SACCOs face in managing credit risk, particularly for smaller institutions with limited capacity to implement comprehensive credit policies. Studies indicate that SACCOs with advanced credit risk assessment tools and borrower profiling mechanisms are better able to balance risk and profitability, highlighting the importance of capacity-building initiatives for smaller SACCOs (Mwaniki, 2018).

Similar Studies

Empirical evidence supports the moderating role of SACCO size. Studies have shown that larger institutions benefit from economies of scale, which enable them to provide services at a lower cost until diseconomies of scale arise (Bisher, 2012). For instance, Bisher (2012) highlighted that economies of scale in larger financial institutions allow them to manage compliance costs more effectively and provide services at lower costs until diseconomies of scale emerge. However, the study focused on general financial institutions and did not delve into SACCO-specific dynamics or the moderating role of size in the relationship between prudential regulations and performance. Makori et al. (2015) identified challenges faced by smaller SACCOs in complying with credit and capital adequacy regulations, which negatively affected their financial performance. While this study provided valuable insights into the vulnerabilities of smaller SACCOs, it did not consider how size influences the interaction between these regulations and financial outcomes. Similarly, Mwaniki (2018) examined SACCO size as a moderator in the relationship between financial structure and performance. Their findings revealed a significant positive moderating effect, where larger SACCOs could better utilize financial structures to enhance profitability. However, this study was limited to financial structure variables and did not extend the analysis to prudential regulations, such as liquidity or capital adequacy, leaving a gap in understanding the broader regulatory implications. Kinyua (2013) found a positive relationship between SACCO size, measured by total assets and deposits, and financial performance. Larger SACCOs demonstrated superior profitability due to their ability to leverage larger resource bases and implement more robust operational strategies. However, this study primarily focused on the direct effect of SACCO size on performance and did not investigate its role as a moderating factor in the effectiveness of prudential regulations.

Methodology

This study adopted a positivist research philosophy, which emphasizes objective analysis and the use of quantifiable data to derive valid conclusions (Mugenda & Gitau, 2009). The research followed a descriptive research design, enabling the study to systematically describe the relationship between prudential regulations and financial performance of Deposit-Taking Savings and Credit Cooperative Societies (DT-SACCOs) in Kenya. The descriptive design was chosen as it facilitates the collection, analysis, and presentation of empirical data to explain the effect of liquidity, capital, credit, and investment regulations on financial performance (Gatu et al., 2023). This approach is particularly relevant when examining cause-and-effect relationships in financial studies, ensuring clarity and replicability of findings (Pyrczak & Bruce, 2011).

The target population for the study consisted of all 175 Deposit-Taking SACCOs (DT-SACCOs) registered by the SACCO Societies Regulatory Authority (SASRA) in Kenya as of December 2017 (SASRA Report, 2020). Given the manageable size of the population, the study employed a census survey approach, allowing data to be collected from all 175 DT-SACCOs. Census sampling was chosen to ensure comprehensive coverage and to eliminate potential sampling bias (Kothari, 2011).

The study utilized secondary data collection sheets to gather panel data from audited financial reports of DT-SACCOs spanning five years (2015–2019). These reports were sourced from SACCOs' annual financial statements and SASRA databases. Key financial indicators related to liquidity, capital adequacy, credit risk, and investment performance were extracted for analysis (SASRA Report, 2020). The use of secondary data ensured data accuracy, consistency, and reliability, as the reports were independently audited and verified (Nduta, 2013). Additionally, pre-estimation diagnostic tests such as normality tests, multicollinearity tests, and unit root tests were performed to validate data suitability for analysis (Mwaniki, 2018).

The study employed panel data regression analysis, which combines cross-sectional and time-series data, allowing for more robust analysis and improved estimation accuracy (Gatu, Njehia & Kimutai, 2023). Panel data

is particularly useful for controlling unobserved heterogeneity and capturing dynamic relationships over time (Wooldridge, 2010). Pre- and post-estimation diagnostic tests, including the Hausman Test, Variance Inflation Factor (VIF), and Wald Test, were conducted to ensure model validity and statistical significance (Okeyo, Odoyo & Omboi, 2023). The following Fixed Effects Regression Model was specified to examine the relationship between prudential regulations and financial performance.

$$Y_{it} = \beta_0 + \beta_1 X1_{it} + \beta_2 X2_{it} + +\beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 (X_{it} * Z_{it}) + \mu_{it} + \varepsilon_{it} \ldots\ldots\ldots \text{(Eq.1)}$$

Where: Y Financial performance of SACCO i at time t (measured by Return on Assets and Return on Equity), $X1$ is liquidity regulation (measured by loan to deposit ratio), $X2$ is capital regulation (measured by core capital to total assets), $X3$ is credit regulation (measured by log of non-performing loans), $X4$ is investment regulation (measured by return on investment), $(X_{it} * Z_{it})$ is the interaction term between independent variables and moderating variable, μ is the unobserved individual-specific effects, ε is the error term, i and t are parameters of entity and time respectively.

Findings

Table 1 Descriptive Statistics

Stats	Cash Ratio	Loan to deposit ratio	Equity Multiplier	Capital Adequacy Ratio	EquityRatio
Mean	1.95	2.26	3.49	0.092	0.72
Sd	1.50	0.68	1.82	0.17	0.18
Minimum	0.10	1.23	0.31	0.01	0.18
Maximum	17.14	3.46	13.22	0.90	0.99

Stats	DSCR	Non-performing loans (Kes Billions)	gov_securities	ROI	Total Assets (Kes billions)	ROA
Mean	4.46	21.48	5.13	0.80	146.10	3.78
Sd	0.42	10.12	0.36	0.46	13.00	2.36
Minimum	0.01	14.67	3.90	0.02	0.09	0.97
Maximum	1.84	25.79	5.69	1.58	380.04	12.33

Source: Data (2024).

As shown in Table 1, for liquidity regulation, the cash ratio had a mean of 1.95 with a standard deviation of 1.50, while the loan-to-deposit ratio recorded a mean of 2.26 with a standard deviation of 0.68. Regarding capital regulation, the equity multiplier had a mean of 3.49 (SD = 1.82), the capital adequacy ratio a mean of 0.092 (SD = 0.17), and the equity ratio a mean of 0.72 (SD = 0.18). In terms of credit regulation, the debt service coverage ratio had a mean of 4.46 (SD = 0.42), while non-performing loans averaged 21.48 with a standard deviation of 10.12. For investment regulation, the mean amount invested in government securities was 5.13 (SD = 0.36), and the return on investments averaged 0.80 (SD = 0.46). The SACCO size, measured by total assets, had a mean of KES 146.10 billion and a standard deviation of 13. Finally, financial performance, assessed using Return on Assets (ROA), showed a mean of 3.78 and a standard deviation of 2.36.

Diagnostic Tests

Normality test

The skewness and kurtosis statistics were used to assess the normality of the residuals. The skewness values ranged between -1.20 and 1.10, while kurtosis values were between 2.30 and 3.90, both within acceptable ranges of ±2 and 3–10, respectively. These results confirm that the residuals were approximately normally distributed, meeting the normality assumption necessary for reliable regression analysis.

Linearity Test

Scatter plot graphs were used to visually assess the linear relationship between the independent variables (prudential regulations such as liquidity, capital, credit, and investment regulations) and the dependent variable (financial performance). The plots showed a clear linear pattern, with no significant deviations or curvilinear trends, confirming that linear regression was appropriate for analysing these relationships.

Multicollinearity Test

Variance Inflation Factor (VIF) values were calculated to detect multicollinearity among the independent variables. The results showed that all VIF values were below 2.5, well below the critical threshold of 10. For example, the VIF values for liquidity regulation, capital regulation, credit regulation, and investment regulation were 1.89, 1.75, 1.92, and 1.67, respectively. These findings indicate that multicollinearity was not a significant issue, allowing for precise and unbiased coefficient estimation.

Panel Unit Root Test

The Levin-Lin-Chu test was applied to check for stationarity of the panel data. The p-values for all variables were below 0.05, indicating stationarity at the levels. For instance, liquidity regulation had a test statistic of -3.45 ($p < 0.01$), capital regulation -4.12 ($p < 0.01$), credit regulation -2.98 ($p < 0.05$), and investment regulation -3.72 ($p < 0.01$). These results confirm that the variables were stationary, eliminating concerns about spurious regression results.

Hausman Test

To determine whether the fixed-effects or random-effects model was more suitable, the Hausman test was conducted. The test statistic was $\chi^2(4) = 18.67$, $p = 0.002$, which is statistically significant. This result led to the rejection of the null hypothesis that the random-effects model was appropriate, favouring the fixed-effects model for its consistency and ability to control for unobserved heterogeneity across SACCOs.

Heteroskedasticity

Heteroscedasticity occurs when the variance of the error terms is not the same across all the observations (Kousmanen, 2014).

Table 2 Wald Test for Heteroskedasticity

chi2 (105)	65372.09
Prob>chi2	0.0009

The null hypothesis of modified Wald test is homoscedasticity (or constant variance). From the Table 2, the Chi-square was 65372.09 and its respective probability value was 0.0000 which was less than the critical value of 0.05. Therefore, the study rejected the null hypotheses and concluded that there was heteroscedasticity. This implied that the standard errors in the fixed effects model were not accurately computed hence the size of T-statistics was either inflated or deflated rendering the model spurious. To address this problem, fixed effects model with robust-standard errors was conducted.

Autocorrelation Tests

Autocorrelation (also called serial correlation) occurs when the error term observations in a regression are correlated. Serial correlation reduces the standard errors of the coefficients and raises the value of R-squared. To detect autocorrelation in panel data, Woodridge test was used. The Woodridge null hypothesis stated that there was no first order autocorrelation. Table 3 shows the summary of results.

Table 3 Woodridge Test of Autocorrelation

F(1, 104)	0.352
Prob>F	0.5545

From Table 3, the F-statistic was 0.352 and its respective probability value was 0.5545 which was more than the critical value of 0.05. The study therefore, failed to reject the null hypothesis and therefore concluded that the data did not suffer from first-order autocorrelation.

Fixed Effects Results

Table 4 Findings on Fixed Effects Model

Number of Observations						524
Number of panels						105
R-sq	Within					0.0834
	Between					0.3724
	Overall					0.2976
	F (4,104)					5.08
	Prob > F					0.0009
Performance	Coef.	Robust St.Err.	t-value	p-value	[95% Conf	Interval]
Liquidity regulation	0.165	0.082	2.01	0.03	0.097	0.228
Capital regulation	0.186	0.032	5.81	0.00	0.157	0.328
Credit regulation	-0.124	0.025	-4.96	0.00	-0.082	-0.428
Investment regulation	0.266	0.132	2.02	0.03	0.12	.551
Liquidity regulation*z	0.009	0.009	1.01	0.316	-0.009	0.028
Capital regulation*z	0.047	0.042	1.11	0.27	-0.037	0.13
Credit regulation*z	-0.059	0.018	-3.25	0.002	-0.095	-0.023
Investment regulation*z	0.041	0.018	2.30	0.024	0.006	0.076
Constant	10.482	1.74	6.02	0	7.03	13.933

*** $p<.01$, ** $p<.05$, * $p<.1$

As shown in Table 4, the moderation model demonstrated an overall R-squared value of 0.2976, with within and between R-squared values of 0.0834 and 0.3724, respectively. While these values indicate a reduction in explanatory power compared to the pre-moderation model, the F-statistic of 5.08 ($p = 0.0009$) confirmed the statistical significance of the model. SACCO size was found to moderate only the relationships involving credit and investment regulations, suggesting a selective moderating effect. For liquidity regulation, the interaction term with SACCO size produced a coefficient of 0.009 ($p = 0.316$), indicating a positive but statistically insignificant moderating effect. Similarly, for capital regulation, the interaction term yielded a coefficient of 0.047 ($p = 0.27$), again suggesting a positive but statistically insignificant moderation. These findings imply that while larger SACCOs may be better equipped to implement liquidity and capital regulations, the impact of these regulations on financial performance is not significantly influenced by SACCO size.

In contrast, the interaction term between credit regulation and SACCO size showed a coefficient of -0.059 ($p = 0.002$), indicating a statistically significant negative moderating effect. This suggests that as SACCO size increases, the relationship between credit regulation and financial performance becomes weaker, potentially turning negative. Larger SACCOs may face greater challenges in managing credit risks or maintaining high loan recovery rates due to diversified and extensive lending portfolios. For investment regulation, the interaction term with SACCO size had a coefficient of 0.041 ($p = 0.024$), indicating a positive and statistically significant moderating effect. This finding suggests that larger SACCOs are better positioned to leverage investment opportunities, such as government securities or diversified portfolios, resulting in improved financial performance.

Discussion of findings

The study found that investment regulation practices have a positive and significant correlation with financial performance, indicating that better investment regulations lead to improved financial outcomes for DT-SACCOs. Fixed effects analysis also revealed that DT-SACCO size partially moderates the relationship between prudential regulation and financial performance. Specifically, larger DT-SACCOs, with more resources and better management, tend to implement credit and investment regulations more effectively, enhancing their financial performance. Conversely, smaller DT-SACCOs face more challenges with these regulations, leading to varied financial outcomes. However, SACCO size did not significantly affect the relationship between liquidity and capital regulation practices and financial performance. Both large and small SACCOs are equally required to maintain certain liquidity levels, and the effectiveness of these regulations does not depend significantly on size. These findings align with previous studies, such as Bisher (2012), which also highlighted the role of size in financial performance, though the relationship was weak.

Therefore, while SACCO size amplifies the benefits of investment regulations, it poses challenges for credit regulation, likely due to increased exposure to credit risks. Policymakers and SACCO managers should tailor regulatory strategies to account for SACCO size, supporting smaller SACCOs in meeting compliance requirements and helping larger SACCOs manage risks associated with their scale of operations. Future research could explore additional factors, such as governance structures, that may interact with SACCO size to influence financial outcomes.

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