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**The Intervening Effect of Capital Adequacy on the Relationship between IFRS 9
Adoption and Financial Performance of Deposit-Taking SACCOs in Kenya**

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The Intervening Effect of Capital Adequacy on the Relationship between IFRS 9 Adoption and Financial Performance of Deposit-Taking SACCOs in Kenya



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Abstract

Purpose: This study examined the intervening effect of capital adequacy on the relationship between International Financial Reporting Standard 9 (IFRS 9) adoption and the financial performance of deposit-taking Savings and Credit Cooperative Societies (DT-SACCOs) in Kenya.

Methodology: The study adopted a quantitative longitudinal ex-post facto research design and a census of regulated DT-SACCOs, yielding an unbalanced panel of 1,543 SACCO-year observations from 177 DT-SACCOs over 2016–2024. Secondary data were extracted from audited financial statements and Sacco Societies Regulatory Authority (SASRA) supervisory records. Financial performance was measured using return on assets (ROA), capital adequacy using institutional capital to total assets (ICA), and IFRS 9 adoption using an implementation-period indicator coded 0 for 2016–2018 and 1 for 2019–2024. Fixed-effects panel regressions with SACCO-clustered robust standard errors were estimated, and the indirect effect was tested using the Sobel test and a 2,000-replication SACCO-cluster bootstrap.

Findings: The IFRS 9 implementation-period indicator did not significantly predict ICA ($\beta = -0.0022$, $p = .623$), while ICA had a positive but statistically insignificant relationship with ROA ($\beta = 0.0375$, $p = .193$). The estimated indirect effect (-0.0000828) was insignificant under both the Sobel test ($p = .645$) and the clustered bootstrap ($p = .723$), with both bootstrap confidence intervals including zero. The null hypothesis was therefore not rejected. A supplementary threshold analysis indicated that the ICA–ROA relationship may be nonlinear around the 8% institutional-capital benchmark.

Unique Contribution to Theory, Practice and Policy:

The study refines Capital Adequacy Theory by distinguishing the prudential, loss-absorbing role of capital from its role as a statistical transmission mechanism for IFRS 9 effects, and extending IFRS 9 evidence to cooperative financial institutions. SACCO managers should integrate capital planning with expected credit loss estimation, credit-risk assessment and asset-quality management rather than assume that stronger capital automatically converts IFRS 9 provisioning into improved profitability. SASRA and policymakers should retain capital adequacy as a prudential safeguard while evaluating capital ratios alongside impairment practices, asset quality, external borrowing and institutional capacity to apply forward-looking credit-loss models.

Keywords: IFRS 9 Adoption, Capital Adequacy, Financial Performance, Mediation Analysis, Deposit-Taking SACCOs

JEL Classification: G21, G28, M41, M48, P13

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INTRODUCTION

Savings and Credit Cooperative Societies (SACCOs) are important financial intermediaries in Kenya because they mobilise member savings and provide credit within a member-owned cooperative structure. Deposit-taking SACCOs operate under prudential supervision by the Sacco Societies Regulatory Authority (SASRA), and their sustainability depends on profitability, asset quality, adequate capital, credible financial reporting and the capacity to absorb credit losses (SASRA, 2024b). These characteristics make the sector a useful setting in which to examine the interaction between financial reporting requirements and prudential capital.

IFRS 9 Financial Instruments replaced the incurred-loss impairment approach under IAS 39 with a forward-looking expected credit loss (ECL) model. The model requires recognition of 12-month expected credit losses for performing exposures and lifetime expected credit losses where credit risk has increased significantly, thereby bringing credit-loss recognition forward relative to the previous framework (International Accounting Standards Board [IASB], 2014). The IASB's post-implementation review has since concluded that the impairment requirements generally achieve more timely recognition of credit losses and provide useful information to users, while also highlighting implementation and disclosure challenges (IFRS Foundation, 2024).

The consequences of IFRS 9 may extend beyond the immediate effect of impairment charges on profitability. Earlier recognition of expected losses can reduce current earnings and retained surpluses and may therefore affect regulatory or institutional capital. Novotny-Farkas (2016) explains that the ECL approach can reduce delayed loss recognition but may also increase the volatility of regulatory capital. The Basel framework similarly recognises an interaction between accounting provisions under IFRS 9 and prudential capital treatment (Bank for International Settlements [BIS], 2017).

Capital adequacy therefore provides a plausible mechanism through which IFRS 9 adoption could be associated with financial performance. Capital buffers enable financial institutions to absorb losses and maintain operations during periods of stress (Berger et al., 1995). In a cooperative institution, the relevance of capital is particularly pronounced because members are both owners and users of financial services. If IFRS 9-related provisions reduce retained surpluses, the resulting change in institutional capital could, in principle, affect the SACCO's capacity to lend, absorb losses and generate returns.

The Kenyan setting is important because IFRS 9 implementation has taken place within a SACCO sector characterised by differences in institutional capacity, data quality, credit-risk modelling and financial strength. Evidence from Kenyan commercial banks indicates that the transition to IFRS 9 was associated with higher expected-credit-loss impairment, although the estimated relationship between ECL impairment and ROA was not statistically significant in one early Kenyan banking study (Omukhulu, 2020). Evidence from Kenyan DT-SACCOs also shows that capital adequacy is related to financial performance, although the direction and nature of that relationship are not uniform across studies (Ngui & Jagongo, 2017; Bett & Nyatete, 2024).

The capital structure of DT-SACCOs, however, differs fundamentally from that of commercial banks, and this difference limits the direct transfer of banking-based capital arguments, including those developed under the Basel framework, to the cooperative sector. Commercial banks can respond to capital shortfalls by issuing new equity or other capital instruments in

capital markets. DT-SACCOs have no comparable access to external equity. Their capital is built mainly from member share capital, which grows only as fast as members are willing and able to contribute, and from institutional capital, which comprises disclosed reserves, retained earnings, grants and donations (Republic of Kenya, 2010; SASRA, 2024b). Because retained surpluses are the principal internal source of loss-absorbing capital, an increase in impairment charges under IFRS 9 reduces the very earnings from which a SACCO rebuilds its capital buffer, and the institution cannot readily offset that reduction by raising fresh capital externally. Provisioning shocks arising from IFRS 9 may therefore bear more directly and more persistently on the capital position of a SACCO than on that of a commercial bank.

SASRA monitors the capital adequacy of DT-SACCOs through three prudential ratios: core capital to total assets (minimum 10%), core capital to total deposits (minimum 8%) and institutional capital to total assets (minimum 8%), in addition to an absolute core-capital floor of KSh 10 million (Republic of Kenya, 2010, Reg. 9). This study uses institutional capital to total assets (ICA) as the intervening variable because it isolates the component of capital that is most directly exposed to IFRS 9 provisioning and that functions as the SACCO's true loss-absorbing buffer. Core capital includes fully paid-up member shares in addition to institutional capital, so its level depends partly on continued membership and member contributions rather than on the SACCO's own earnings. Institutional capital, by contrast, comprises disclosed reserves, retained earnings, grants and donations that are not meant to be expended except on liquidation (Republic of Kenya, 2010, Reg. 3). It belongs to the institution as a whole, cannot be withdrawn by exiting members, and is built up or eroded directly through the income statement. Changes in expected-credit-loss provisions should therefore transmit most directly to ICA. The core-capital ratios (CCA and CCD) are retained in the analysis through the CAPIDX indicator, so that the intervening role of institutional capital is assessed net of the broader core-capital position.

Statement of the Problem

Deposit-taking SACCOs in Kenya are expected to maintain credible financial reporting, effective credit-risk management and adequate capital buffers. IFRS 9 was intended to support these objectives by introducing new requirements for the classification, measurement and impairment of financial assets (IASB, 2014). Implementation within the sector has, however, been uneven. By the end of 2022, only 64.2% of DT-SACCOs had fully adopted the standard, while 35.8% had either partially implemented or not adopted it, and 25.9% received qualified audit opinions largely because of inadequate provisioning for expected loan losses (SASRA, 2022). Smaller Tier III SACCOs were the most affected, with fewer than half achieving full compliance because of limited technical and financial capacity (SASRA, 2023).

These provisioning pressures matter for capital as well as for profitability. Because institutional capital in a SACCO is accumulated largely from retained surpluses, higher expected-credit-loss provisions could weaken capital buffers and, through them, lending capacity and returns. In a member-owned cooperative, this is not only a prudential concern. Lending to members is the core purpose of a DT-SACCO, and growth in its loan portfolio is constrained by the capital ratios that SASRA enforces. A SACCO whose institutional capital is eroded by provisioning may have to restrict or ration credit to its own members, reduce dividends and interest on member deposits, or retain a larger share of surpluses to rebuild capital, each of which weakens the socio-economic benefits that members derive from the cooperative. Uneven IFRS 9 implementation and inadequate provisioning therefore threaten not only the reported financial

position of DT-SACCOs but also their core mandate of providing affordable credit to the members who own them. The broader IFRS 9 literature nevertheless remains concentrated in banking and in more developed financial systems. Awuye and Taylor (2025) document substantial implementation challenges, including data limitations, forecasting uncertainty and cross-country heterogeneity, and identify a need for more evidence from under-researched jurisdictions, particularly Africa. Zang et al. (2026) similarly conclude that institutional context and managerial incentives shape the effects of IFRS 9, while Taylor et al. (2025) show that the informational benefits of IFRS 9 among African banks depend partly on regulatory and enforcement quality. This gap is even more pronounced for cooperative financial institutions whose capital formation, ownership and lending structures differ from those of commercial banks.

Importantly, evidence that IFRS 9 affects provisioning or profitability and evidence that capital adequacy affects performance do not establish an intervening relationship. An intervening mechanism requires evidence that IFRS 9 is associated with the proposed mediator and that the mediator is subsequently associated with performance, producing a statistically meaningful indirect effect. The complete IFRS 9–capital adequacy–financial performance pathway has received limited empirical testing among Kenyan DT-SACCOs.

This study therefore examined the intervening effect of capital adequacy on the relationship between IFRS 9 adoption and financial performance among deposit-taking SACCOs in Kenya. Capital adequacy was measured using institutional capital to total assets (ICA), while financial performance was measured using return on assets (ROA). By testing the indirect pathway explicitly, the study distinguishes the prudential importance of capital adequacy from its role as a statistical transmission mechanism and extends IFRS 9 evidence beyond conventional commercial banking institutions.

LITERATURE REVIEW

Theoretical Framework

Capital Adequacy Theory

The study is principally underpinned by Capital Adequacy Theory, which emphasises the role of capital in absorbing losses, protecting depositors and supporting the continuity of financial institutions. Capital is important because financial institutions operate with leverage, information asymmetry and regulatory constraints, making sufficient loss-absorbing capacity central to safety and soundness (Berger et al., 1995).

The relevance of the theory becomes more pronounced under IFRS 9 because the ECL model brings forward the recognition of credit losses. Earlier impairment recognition can reduce earnings and retained surpluses and thereby affect regulatory or institutional capital. A well-capitalised SACCO may be better able to absorb such provisioning without materially weakening its lending capacity or operational continuity, whereas an institution with a weak capital base may face greater pressure. Capital Adequacy Theory therefore provides a direct theoretical basis for examining ICA as a potential intervening mechanism linking IFRS 9 adoption to financial performance.

Agency Theory

Agency Theory provides a complementary perspective because IFRS 9 can improve the timeliness and transparency of credit-risk information, thereby reducing information asymmetry between managers, members and regulators (Jensen & Meckling, 1976). This role

is particularly relevant in SACCOs, where information asymmetry between management and boards, on the one hand, and dispersed member-owners, on the other, is high. Under the incurred-loss model of IAS 39, management could defer loss recognition until a default event occurred, allowing deteriorating loans to remain masked in reported surpluses and capital. By requiring forward-looking, staged recognition of expected credit losses, IFRS 9 functions as an agency-mitigation mechanism that compels earlier and more transparent disclosure of credit risk, and it is precisely this earlier recognition that brings credit deterioration onto the capital base examined in this study. However, because the present article specifically examines the capital transmission mechanism, Capital Adequacy Theory is treated as the principal theoretical lens.

Conceptual Framework

The conceptual framework specifies capital adequacy as the intervening variable through which IFRS 9 adoption may be associated with the financial performance of deposit-taking SACCOs. IFRS 9 adoption is represented by the implementation-period indicator and is interpreted together with the study's financial-asset measurement and impairment indicators: the capital index (CAPIDX), the non-performing loans ratio (NPLR) and the ratio of external borrowing to total assets (EBTA). The framework also recognises a direct IFRS 9–performance path, while SACCO size enters as a covariate (Figure 1).

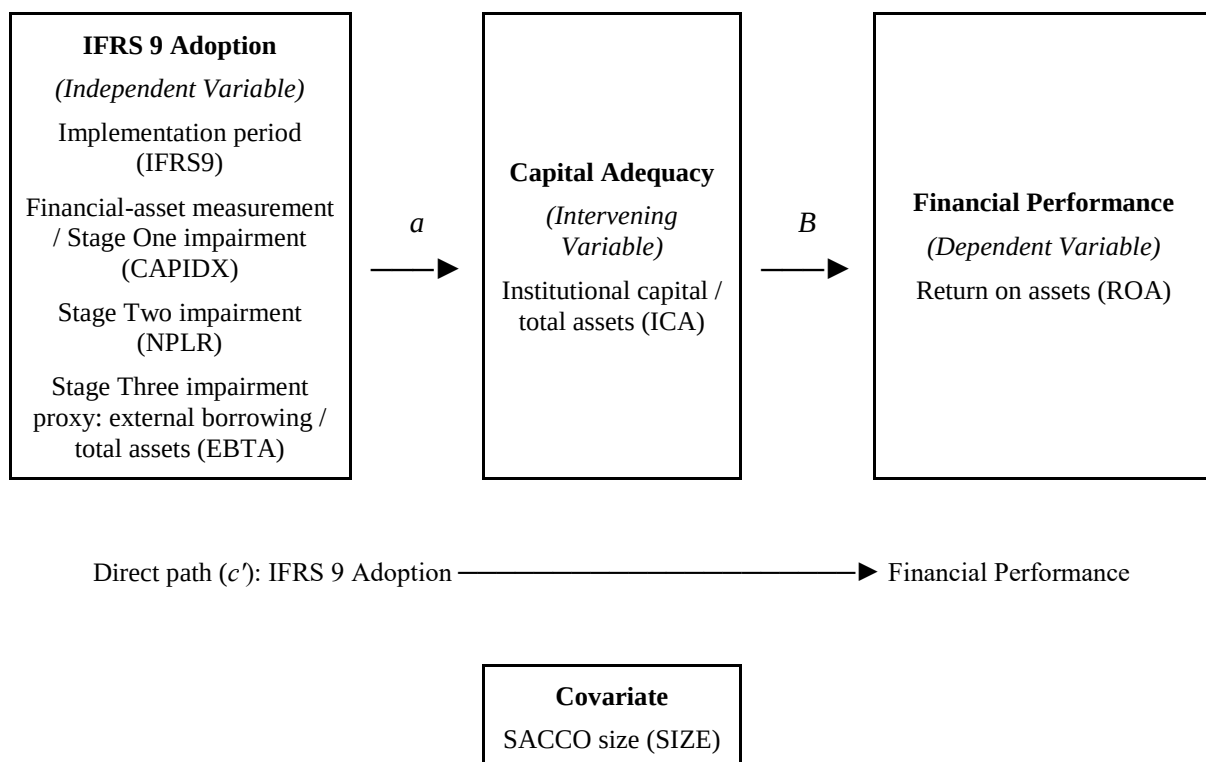


Figure 1: Conceptual Framework

In this study, EBTA denotes external borrowing to total assets. It is a balance-sheet funding ratio and should not be confused with earnings-based income-statement measures that carry similar acronyms. EBTA is used as an indirect, consequence-based proxy for Stage Three impairment for three reasons. First, a direct measure was not available across the full panel. Stage-based allowances did not exist under the IAS 39 incurred-loss framework that applied in

the 2016–2018 pre-implementation years, so a Stage Three allowance variable would have been undefined for one-third of the study period and could not have supported a consistent before-and-after comparison. Second, the proxy follows directly from the IFRS 9 definition of Stage Three. A financial asset is credit-impaired when one or more events have occurred that have a detrimental impact on its estimated future cash flows (IASB, 2014). In DT-SACCOs, lending is funded predominantly by member deposits and loan repayments, so the loss of repayment cash flows from credit-impaired loans translates directly into a funding gap. SASRA reports, for example, that KSh 1.68 billion of the funds not remitted to regulated SACCOs in 2023 consisted of loan repayment deductions, implying that the underlying loans stood defaulted, while interest paid by SACCOs on external debt rose from KSh 2.76 billion in 2022 to KSh 3.37 billion in 2023 (SASRA, 2024a). Because a SACCO cannot raise external equity, it must respond to such a gap either by curtailing lending or by turning to external borrowing to meet member withdrawals and loan demand. This mechanism is consistent with evidence that higher non-performing loans raise liquidity risk because impaired loans reduce the cash flows available to meet depositors' withdrawal demands (Cai & Zhang, 2017). Third, the empirical behaviour of EBTA in this study is consistent with its interpretation as a marker of severe credit stress: EBTA is strongly and negatively associated with ROA in both the total-effect and outcome models ($p < .001$), the pattern expected of an indicator that reflects the earnings drag of impaired portfolios and the interest cost of replacement funding. EBTA therefore captures the observable funding consequence of Stage Three impairment rather than the allowance itself, and it complements NPLR in representing the credit-risk dimension of IFRS 9. Because the proxy is indirect, results relating to EBTA are interpreted with caution, and this is acknowledged as a limitation of the study.

Empirical Review

IFRS 9 Adoption and Capital Adequacy

IFRS 9 introduced a forward-looking ECL approach under which credit deterioration is recognised before an actual default event occurs. Although this approach improves the timeliness of credit-loss recognition, increased impairment allowances can reduce current earnings and accumulated retained surpluses. Because retained earnings contribute to capital formation, the consequences of IFRS 9 may extend beyond profitability to the capital position of the institution (IASB, 2014; BIS, 2017). The forward-looking model also places considerable weight on forecasts and managerial judgement, which can produce variation in ECL measurement across institutions (Du et al., 2023; Zang et al., 2026).

Novotny-Farkas (2016) argues that earlier expected-loss recognition can reduce the overstatement of regulatory capital but can also increase capital volatility under some conditions. Empirical evidence reinforces the connection between IFRS 9 and capital management. Dong and Oberson (2022) show that the transition to the ECL model interacted with regulatory-capital constraints and transitional arrangements among European banks, while López-Espinosa and Penalva (2023) report changes in the timeliness of loss recognition and Tier 1 capital after IFRS 9 adoption among Spanish banks. Beatty and Liao (2014) similarly show that bank accounting choices and loan-loss recognition are closely linked to regulatory capital and economic decision-making. These arguments provide a basis for expecting a relationship between IFRS 9 implementation and institutional capital. However, commercial banks differ from DT-SACCOs in ownership structure, sources of capital and funding arrangements, making SACCO-specific evidence necessary.

Capital Adequacy and Financial Performance

Capital adequacy is widely regarded as an important determinant of financial resilience because sufficient capital enables an institution to absorb losses, maintain operations and preserve stakeholder confidence. At the same time, the relationship between capital and profitability may not be uniformly positive because high capital requirements can constrain the resources available for lending and other income-generating activities.

Evidence on the capital-performance relationship among Kenyan DT-SACCOs is mixed. Ngui and Jagongo (2017), Wambua et al. (2021), Okeyo et al. (2023), Tarus and Simiyu (2024), and Wanjiru et al. (2024) report evidence consistent with a positive or financially important role for capital adequacy. In contrast, Mirichii et al. (2023) report an insignificant capital-adequacy effect in their specification, while Bett and Nyatete (2024) find that SASRA capital-adequacy requirements had a statistically significant negative effect on financial performance. This mixed evidence highlights a potential trade-off between prudential strength and income-generating capacity and reinforces the need to distinguish a direct capital-performance association from an intervening IFRS 9–capital–performance mechanism.

Intervening Role of Capital Adequacy

The proposed mechanism follows a sequential relationship. IFRS 9 requires earlier recognition of expected credit losses; additional impairment can reduce earnings and retained surpluses; and changes in institutional capital can subsequently influence the ability of a SACCO to absorb losses, maintain lending capacity and generate returns. Under this mechanism, capital adequacy is not merely another determinant of performance but a potential channel through which part of the IFRS 9 adoption–performance association could operate.

Research Gaps

Existing research largely examines the components of this pathway separately. IFRS 9 studies commonly focus on impairment, provisioning, capital or profitability in commercial banks. For example, Taylor and Aubert (2022) examine post-adoption reporting behaviour in European and Sub-Saharan African banks, Ongalo and Wanjare (2022) examine Kenyan commercial-bank performance, and López-Espinosa and Penalva (2023) examine lending and regulatory capital after IFRS 9 adoption. More recent African evidence also shows that institutional and enforcement conditions affect IFRS 9 outcomes (Taylor et al., 2025). By contrast, Kenyan SACCO studies typically examine the direct relationship between capital adequacy and financial performance. Awuye and Taylor (2025) and Zang et al. (2026) further show that IFRS 9 evidence remains geographically and institutionally concentrated. Consequently, the complete indirect pathway among Kenyan DT-SACCOs remains insufficiently established.

To address this gap, the study tested the following null hypothesis:

H₀*:** Capital adequacy has no significant intervening effect on the relationship between IFRS 9 adoption and the financial performance of deposit-taking SACCOs in Kenya.

Consistent with current methodological standards for testing indirect effects, the hypothesis was evaluated using a product-of-coefficients approach rather than Baron and Kenny's (1986) causal-steps procedure, which treats a significant total effect as a precondition for mediation and has comparatively low power to detect indirect effects (Preacher & Hayes, 2008; Hayes, 2022). The indirect effect was estimated within a regression-based panel path-analytic framework and tested using the Sobel test and a SACCO-clustered bootstrap, as detailed in the methodology section.

METHODOLOGY

Research Design

The study adopted a quantitative longitudinal ex-post facto research design because IFRS 9 implementation and the financial outcomes examined had already occurred and could not be manipulated by the researcher. Repeated annual observations supported panel-data estimation and allowed the analysis to account for persistent institution-specific characteristics.

The study covered nine financial years from 2016 to 2024. IFRS 9 adoption was operationalised using an implementation-period indicator, with 2016–2018 coded as the pre-implementation reference period and 2019–2024 coded as the implementation period. The period indicator was interpreted together with CAPIDX, NPLR and EBTA, which captured the financial-asset measurement and impairment dimensions used in the study. Because all regulated DT-SACCOs were exposed to the same broad implementation environment and there was no credible untreated comparison group, the IFRS 9 coefficient is interpreted as an implementation-period association conditional on the included model covariates rather than as a causal treatment effect.

Population, Sampling and Sample Size

The study population comprised regulated DT-SACCOs in Kenya. A census approach retained all eligible institutions with usable annual observations. The final analytical dataset comprised 1,543 SACCO-year observations from 177 DT-SACCOs. The panel was unbalanced but dense, with institutions contributing between four and nine annual observations and an average of 8.7 observations per SACCO.

Data Collection Procedure

Secondary financial information was obtained from audited financial statements, SASRA supervisory information, statutory returns and other relevant regulatory records. A structured extraction schedule was used to standardise institution-year data. Ratios were recomputed where necessary, duplicate SACCO-year observations were checked and figures available from multiple sources were cross-verified rather than averaged.

Measurement of Variables

Financial performance was measured using ROA and capital adequacy using ICA. IFRS 9 adoption was represented by the implementation-period indicator and interpreted together with CAPIDX, NPLR and EBTA. CAPIDX combined core capital to total assets (CCA) and core capital to total deposits (CCD) and therefore represented the financial-asset measurement and Stage One impairment component; NPLR represented Stage Two impairment; and EBTA, the ratio of external borrowing to total assets, served as a proxy for Stage Three impairment. SACCO size, measured as the mean-centred natural logarithm of total assets, was included as a covariate to account for differences in institutional scale that may influence capital adequacy and financial performance. Table 1 summarises the operationalisation of the variables.

Table 1: Measurement and Operationalisation of Variables

Construct	Symbol	Measurement	Role
Financial performance	ROA	Return on assets	Dependent variable
IFRS 9 adoption	IFRS9	0 = 2016–2018; 1 = 2019–2024	Independent variable
Capital adequacy	ICA	Institutional capital / Total assets	Intervening variable
Financial-asset measurement / Stage One impairment	CAPIDX	First principal component of CCA and CCD	IFRS 9 dimension indicator
Stage Two impairment	NPLR	Non-performing loans / Gross loans	IFRS 9 dimension indicator
Stage Three impairment (proxy)	EBTA	External borrowing / Total assets	IFRS 9 dimension indicator
SACCO size	SIZE	Mean-centred natural logarithm of total assets	Covariate

CCA and CCD were highly correlated ($r = .9493$; VIFs = 19.02 and 13.41). Principal component analysis was therefore used to construct CAPIDX. The first principal component explained 97.47% of their joint variation and reduced the maximum VIF to 3.87.

Model Specification

The intervening effect was tested using a sequential fixed-effects mediation procedure comprising a total-effect model (Equation 1), a mediator equation (Equation 2) and an outcome equation (Equation 3). Consistent with contemporary mediation analysis, the statistical significance of the indirect effect (Equation 4) formed the primary basis for assessing the intervening effect rather than requiring a statistically significant total effect as a precondition (Hayes, 2022). A regression-based path-analytic approach was preferred to latent-variable structural equation modelling because all study constructs are observed financial ratios rather than latent constructs, and because the panel structure required SACCO fixed effects and SACCO-clustered inference, which are accommodated more directly in fixed-effects regression.

$$ROA_{it} = \beta_0 + c(IFRS9_{it}) + \beta_1 CAPIDX_{it} + \beta_2 NPLR_{it} + \beta_3 EBTA_{it} + \beta_4 SIZE_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

$$ICA_{it} = \alpha_0 + a(IFRS9_{it}) + \alpha_1 CAPIDX_{it} + \alpha_2 NPLR_{it} + \alpha_3 EBTA_{it} + \alpha_4 SIZE_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

$$ROA_{it} = \gamma_0 + c'(IFRS9_{it}) + b(ICA_{it}) + \gamma_1 CAPIDX_{it} + \gamma_2 NPLR_{it} + \gamma_3 EBTA_{it} + \gamma_4 SIZE_{it} + \mu_i + \varepsilon_{it} \quad (3)$$

$$\text{Indirect effect} = a \times b \quad (4)$$

In these equations, i denotes the SACCO and t the financial year; μ_i captures time-invariant SACCO fixed effects and ε_{it} is the error term. The coefficient a represents the IFRS 9 implementation-period-to-ICA path, b represents the ICA-to-ROA path after accounting for the IFRS 9 implementation-period indicator and the other variables in the model, c is the total IFRS 9 implementation-period coefficient before ICA enters the outcome model, and c' is the direct coefficient after ICA is introduced.

Statistical Analysis, Diagnostics and Robustness

Data were analysed using descriptive statistics and fixed-effects panel regression. Fixed-effects estimation was used as the reference panel approach because the full-sample Hausman

specification test supported fixed rather than random effects (Hausman, 1978). Standard errors were clustered at the SACCO level to address heteroscedasticity and within-SACCO serial dependence. The results of the diagnostic tests on the final analytical panel are summarised in Table 2.

Table 2: Summary of Diagnostic Tests

Test	Statistic	p-value	Implication
Hausman specification	$\chi^2(6) = 27.23$	.0001	Fixed effects preferred
Breusch–Pagan / Cook–Weisberg	$\chi^2(1) = 31.07$	< .001	Heteroscedasticity present
Wooldridge serial correlation	$F(1, 176) = 5.726$	.0178	First-order autocorrelation present
Shapiro–Wilk normality	$W = 0.83186$	< .001	Non-normal residuals
Pesaran cross-sectional dependence	$CD = 13.203$	< .001	Cross-sectional dependence present

Note. The Pesaran test was applied to the strongly balanced nine-year subset of the panel because the full analytical panel was unbalanced.

Given heteroscedasticity, serial correlation, non-normal residuals and cross-sectional dependence, primary inference used SACCO fixed effects with SACCO-clustered robust standard errors, while Driscoll–Kraay estimates were used as a sensitivity check because they provide covariance estimates robust to broad forms of cross-sectional and temporal dependence in panel data (Driscoll & Kraay, 1998). Influential observations in the raw financial ratios were treated through 1st/99th percentile winsorisation before inferential estimation.

The indirect effect was first evaluated using the Sobel test and then with a 2,000-replication bootstrap clustered at SACCO level. Because the sampling distribution of an indirect effect can be non-normal, resampling-based inference is generally preferred for evaluating indirect effects (Preacher & Hayes, 2008; Hayes, 2022). The clustered bootstrap was therefore treated as the stronger confirmatory criterion. The intervening effect was considered supported only if the indirect effect was statistically distinguishable from zero and its confidence interval excluded zero. Statistical significance was assessed at the 5% level. The results are presented using tables.

RESULTS

Descriptive Statistics

The final analytical panel comprised 1,543 SACCO-year observations from 177 DT-SACCOs. Selected descriptive statistics are presented in Table 3. The values shown are the raw descriptive statistics before the 1st/99th percentile winsorisation used in the inferential models.

Table 3: Selected Descriptive Statistics

Variable	N	Mean	SD	Median
ROA	1,543	0.0376	0.1765	0.0259
ICA	1,543	0.0866	0.4719	0.1034
NPLR	1,543	0.1238	0.1714	0.0618
EBTA	1,543	0.0565	0.2081	0.0185
Total assets (KSh bn)	1,543	3.686	7.451	1.140

Mean ROA was 3.76% and mean ICA was 8.66%. Mean total assets were approximately KSh 3.69 billion, compared with a median of KSh 1.14 billion, indicating substantial differences in institutional scale. Several raw financial ratios contained influential observations; these were investigated and treated systematically through winsorisation before inferential estimation.

Fixed-Effects Mediation Analysis

Table 4 presents the fixed-effects estimates of the total-effect, mediator and outcome models.

Table 4: Fixed-Effects Results for the Intervening Effect of Capital Adequacy

Variable	Model 1: ROA (total effect)	Model 2: ICA (mediator)	Model 3: ROA (with ICA)
IFRS9	-0.0016767 (0.0028642) p = .559	-0.0022095 (0.0044898) p = .623	-0.0015939 (0.0027922) p = .569
CAPIDX	0.0000319 (0.0016275) p = .984	0.0518089 (0.0036903) p < .001	-0.0019097 (0.0026853) p = .478
NPLR	-0.0069197 (0.0068150) p = .311	-0.0437191 (0.0214317) p = .043	-0.0052813 (0.0064433) p = .414
EBTA	-0.1089698 (0.0185450) p < .001	0.0894218 (0.0649543) p = .170	-0.1123209 (0.0197627) p < .001
ICA	—	—	0.0374751 (0.0286861) p = .193
SIZE	-0.0099136 (0.0045729) p = .032	0.0159523 (0.0082270) p = .054	-0.0105115 (0.0043738) p = .017
Within R ²	0.0523	0.6393	0.0547
N / SACCOS	1,543 / 177	1,543 / 177	1,543 / 177

Note. SACCO fixed effects were included in all models. Standard errors in parentheses are robust and clustered at SACCO level.

Total Effect of IFRS 9 Adoption on Financial Performance

The total-effect model was significant overall, $F(5, 176) = 12.43$, $p < .001$, with a within R^2 of 0.0523. The IFRS 9 implementation-period coefficient was negative but statistically insignificant ($c = -0.0016767$, $SE = 0.0028642$, $p = .559$). Thus, after accounting for the variables included in the model, the implementation-period indicator was not significantly associated with ROA in the mediation specification.

EBTA was negatively and significantly associated with ROA ($\beta = -0.1089698$, $p < .001$). The absence of a significant total effect did not, by itself, rule out an indirect effect; the a- and b-paths and the product of coefficients remained the primary basis for the intervening-effect decision.

IFRS 9 Adoption and Capital Adequacy (a-Path)

The mediator model was significant overall, $F(5, 176) = 58.48$, $p < .001$, and explained 63.93% of the within-SACCO variation in ICA. However, the IFRS 9-to-ICA coefficient was negative and statistically insignificant ($a = -0.0022095$, $SE = 0.0044898$, $p = .623$; 95% CI $[-0.0110702, 0.0066513]$). Movement into the implementation period therefore did not predict a statistically significant within-SACCO change in ICA after accounting for the variables included in the model.

CAPIDX was positively associated with ICA ($\beta = 0.0518089$, $p < .001$), while NPLR was negatively associated with ICA ($\beta = -0.0437191$, $p = .043$). EBTA was not statistically significant at the 5% level.

Capital Adequacy and Financial Performance (b-Path and Direct Effect)

The outcome model was significant overall, $F(6, 176) = 10.25$, $p < .001$, with a within R^2 of 0.0547. ICA had a positive but statistically insignificant coefficient ($b = 0.0374751$, $SE = 0.0286861$, $p = .193$; 95% CI $[-0.0191379, 0.0940881]$).

After ICA was introduced, the IFRS 9 coefficient remained negative and statistically insignificant ($c' = -0.0015939$, $p = .569$). The coefficient changed only marginally from the total-effect estimate of -0.0016767 . The small change from c to c' , together with the insignificant a- and b-paths, provided little preliminary evidence of an intervening effect.

Indirect Effect of Capital Adequacy

The estimated indirect effect was $a \times b = -0.00008280$. The Sobel test produced $z = -0.4605$ and $p = .645$, providing no evidence that the product of the mediation paths differed from zero. The 2,000-replication SACCO-cluster bootstrap confirmed the result (Table 5).

Table 5: Tests of the Indirect Effect

Test	Estimate / Statistic	p-value	95% Confidence Interval
Indirect effect ($a \times b$)	-0.00008280	—	—
Sobel test	$z = -0.4605$	.645	—
Cluster bootstrap (normal)	-0.0000828 ; $SE = 0.0002335$	.723	$[-0.0005404, 0.0003748]$
Percentile bootstrap	$Bias = -1.51e-06$; $SE = 0.00023346$	—	$[-0.0006958, 0.0003143]$
Formal bootstrap test	$\chi^2(1) = 0.13$	.723	—

Both bootstrap confidence intervals included zero. The null hypothesis was therefore not rejected: capital adequacy did not have a statistically significant intervening effect on the relationship between IFRS 9 adoption and financial performance in the specified model.

Robustness and Threshold Analysis

The no-intervening-effect conclusion remained stable under alternative inference. Under Driscoll–Kraay estimation, the IFRS 9-to-ICA mediator path remained non-significant, and the indirect-effect tests continued to provide no evidence of a statistically meaningful pathway.

A supplementary sensitivity analysis examined whether the ICA–ROA relationship changed around the 8% institutional-capital benchmark. The model was significant overall, $F(7, 176) = 9.32$, $p < .001$. The linear ICA term was effectively zero ($\beta = -0.000045$, $p = .999$), while the excess-ICA term above 8% was positive ($\beta = 0.0828875$) and approached conventional

significance ($p = .057$). The two ICA terms were jointly significant, $F(2, 176) = 3.78$, $p = .0246$. This result does not establish an intervening effect; instead, it suggests that the performance relevance of institutional capital may be nonlinear.

Discussion

The central finding is that capital adequacy, measured by ICA, did not significantly intervene in the relationship between IFRS 9 adoption and ROA among Kenyan DT-SACCOs. The proposed mechanism required the IFRS 9 implementation period to predict ICA and ICA to predict ROA after accounting for the other variables in the model. Neither relationship was statistically significant, and the product of the two paths was indistinguishable from zero under both normal-theory and clustered-bootstrap inference.

This finding is important because it distinguishes the prudential relevance of capital adequacy from its role as a transmission mechanism. Capital Adequacy Theory provides a strong rationale for maintaining sufficient capital to absorb losses and sustain confidence. The absence of a significant intervening effect does not contradict that prudential role. Rather, it indicates that, within this dataset and specification, continuous ICA was not the pathway through which the IFRS 9 implementation-period association was transmitted to profitability.

The non-significant IFRS 9-to-ICA path is noteworthy because the theoretical expectation was that earlier recognition of expected credit losses could reduce earnings and retained surpluses and thereby place pressure on capital (BIS, 2017; Novotny-Farkas, 2016). International evidence shows that IFRS 9 can interact with regulatory-capital constraints and capital-management responses (Dong & Oberson, 2022; López-Espinosa & Penalva, 2023). One explanation for the present result is that institutional capital reflects more than current-period impairment recognition. It can also be shaped by accumulated retained surpluses, distribution policies, member contributions, growth, asset-quality conditions and management responses to prudential requirements. These factors may dampen or delay the translation of IFRS 9-related impairment into observable annual changes in ICA.

The measurement of IFRS 9 adoption also matters. The study used a common implementation-period indicator rather than a SACCO-specific measure of implementation intensity. Awuye and Taylor (2025) document substantial heterogeneity in the quality and difficulty of IFRS 9 implementation across settings, while Taylor et al. (2025) and Zang et al. (2026) emphasise the role of institutional context, enforcement and managerial incentives in shaping IFRS 9 outcomes. SACCOs may therefore have differed in data quality, modelling capacity, implementation timing and compliance intensity even though they operated within the same broad implementation period. Such heterogeneity may weaken the association between a common period indicator and institutional capital.

The positive but insignificant ICA-to-ROA coefficient also refines the interpretation of earlier SACCO evidence. Kenyan studies report differing capital-performance relationships: positive or significant effects are reported by Ngui and Jagongo (2017), Wambua et al. (2021), Okeyo et al. (2023), Tarus and Simiyu (2024), and Wanjiru et al. (2024), whereas Mirichii et al. (2023) report an insignificant effect and Bett and Nyatete (2024) report a significant negative effect of capital-adequacy requirements. These studies examine direct or regulatory relationships. A direct capital-performance relationship does not establish that IFRS 9 first changes capital and that capital subsequently transmits the effect to performance. The present study explicitly tested that sequence and found no statistically supported indirect pathway.

The threshold analysis provides a useful qualification. The continuous ICA coefficient was insignificant, yet the two threshold terms were jointly significant and the excess-capital slope above 8% was positive at $p = .057$. This pattern suggests that one constant slope may be too restrictive for describing the ICA–ROA relationship. Capital may have different performance implications at different levels of capitalisation. However, the threshold result does not overturn the mediation conclusion because the formal indirect effect through continuous ICA remained insignificant.

CONCLUSION AND RECOMMENDATIONS

Summary

This study examined the intervening effect of capital adequacy on the relationship between IFRS 9 adoption and financial performance among Kenyan DT-SACCOs. Using 1,543 SACCO-year observations from 177 institutions over 2016–2024, the study tested the intervening effect using fixed-effects mediation models and evaluated the indirect effect using both the Sobel test and a 2,000-replication SACCO-cluster bootstrap. The IFRS 9 implementation-period indicator did not significantly predict ICA ($a = -0.0022$, $p = .623$), ICA did not significantly predict ROA ($b = 0.0375$, $p = .193$), and the indirect effect was not statistically different from zero (Sobel $p = .645$; bootstrap $p = .723$). External borrowing to total assets (EBTA) was the most consistent negative correlate of ROA, while a supplementary threshold analysis suggested a possible nonlinear capital–performance relationship above the 8% institutional-capital benchmark.

Conclusion

The evidence did not support a significant intervening effect, and the null hypothesis was therefore not rejected. The result does not imply that capital adequacy is unimportant; rather, it narrows the role attributed to capital from a presumed linear transmission mechanism to a prudential condition whose performance implications may be nonlinear and context-dependent. The results therefore refine rather than reject Capital Adequacy Theory in the IFRS 9 context: capital remains essential for loss absorption and member protection, but stronger capitalisation does not necessarily mean that capital is the channel through which IFRS 9 adoption is associated with profitability.

Recommendations

Theory: The findings contribute to Capital Adequacy Theory by separating loss-absorbing capacity from a statistically supported intervening effect. Capital buffers remain central to resilience and member protection, yet stronger capitalisation does not necessarily mean that capital transmits the financial-performance implications of IFRS 9. Future theorising should therefore shift from whether capital matters to the more specific question of how and under what conditions capital matters.

Practice: SACCO management should manage IFRS 9 implementation and capital planning as related but distinct components of financial management. Maintaining adequate institutional capital remains important, but managers should not assume that stronger capital positions automatically convert IFRS 9-related provisioning changes into improved profitability. Capital planning should be integrated with ECL estimation, credit-risk assessment, loan monitoring, collections, asset-quality management and lending decisions.

Policy: SASRA and policymakers should continue to emphasise capital adequacy as a prudential safeguard while considering the broader conditions surrounding IFRS 9

implementation. Capital ratios should be evaluated alongside asset quality, impairment practices, external borrowing and institutional capacity to apply forward-looking credit-loss models. The threshold result further suggests that supervisory assessment should recognise that the performance implications of capital may differ across capitalisation levels.

Limitations of the Study

First, IFRS 9 adoption was measured using a common implementation-period indicator rather than an institution-specific measure of implementation intensity. The indicator captures the broad regulatory transition but cannot distinguish differences in implementation quality, model sophistication, data systems or degree of compliance. Similarly, Stage Three impairment was proxied indirectly by EBTA rather than measured through institution-level lifetime credit-loss allowances, which do not exist for the pre-2019 IAS 39 years of the panel. Second, the study relied on historical secondary financial data. Although audited financial statements and regulatory records provide objective information, they do not capture qualitative differences in management decisions, credit-risk modelling practices or institutional readiness.

Third, annual data may conceal shorter-term or lagged changes in impairment, capital and financial performance. Fourth, the absence of an untreated comparison group limits causal identification. Finally, macroeconomic and sector-wide developments occurring during the implementation period may have contributed to common time variation even though fixed effects and robust covariance methods were applied.

Suggestions for Further Research

Future studies should employ more granular measures of IFRS 9 implementation, including adoption intensity, institutional readiness, model sophistication and direct ECL allowances where data are available. Dynamic and lagged specifications could test whether impairment and capital adjustments affect profitability with delay rather than within the same financial year.

The possible nonlinear relationship between capital adequacy and performance warrants direct examination using threshold regression, spline models or related nonlinear approaches. Future research should also consider macroeconomic controls, higher-frequency or loan-level data and comparative evidence from non-deposit-taking SACCOs, microfinance institutions, cooperative banks or SACCO systems in other jurisdictions.

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