

Capital Regulation and Bank Growth: Bank-Level Evidence from Kenya

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ABSTRACT

This paper examines the relationship between regulatory capital adequacy and bank growth using a bank-level panel of licensed commercial banks in Kenya over the period 2015–2024. The study evaluates whether higher capital ratios systematically constrain balance-sheet growth in an emerging-market banking system characterized by structural heterogeneity across institutions, given the ongoing debates on the trade-off between financial stability and credit expansion under Basel-style prudential frameworks.

By applying fixed-effects and dynamic System Generalized Method of Moments (System-GMM) estimators to account for unobserved heterogeneity, persistence, and potential endogeneity, the analysis finds no robust evidence that capital adequacy ratios exert a uniform direct effect on asset or deposit growth across banks. Instead, growth dynamics appear primarily driven by structural characteristics such as bank size, profitability, efficiency, and funding composition. The study finds larger banks exhibiting slower expansion, while profitability and funding structure play more consistent roles in shaping growth outcomes.

Heterogeneity analysis indicates that the relationship between capital and growth varies across bank tiers. While higher capital ratios are associated with weaker deposit growth among larger banks, smaller institutions display different adjustment patterns. This may imply that regulatory capital influences balance-sheet and funding strategies in a non-uniform manner. Robustness checks using alternative capital measures confirm that aggregate capital-growth relationships remain modest within the sample period.

These findings contribute to the literature by providing bank-level evidence from an under-studied African emerging market and by highlighting the conditional and heterogeneous nature of capital-regulation effects. Rather than uniformly suppressing expansion, capital requirements appear to operate alongside structural and operational factors that shape bank growth trajectories. The results underscore the importance of context-sensitive prudential calibration and suggest that regulatory capital frameworks can support financial stability without necessarily imposing large aggregate constraints on bank growth when institutions maintain buffers above minimum thresholds.

INTRODUCTION

Bank capital regulation occupies a pivotal role in modern prudential supervision, designed to enhance financial stability by strengthening banks' resilience to shocks. Following the Global Financial Crisis, the Basel III framework significantly tightened capital requirements worldwide, intensifying academic and policy debates on the trade-off between financial stability and credit expansion. While higher capital buffers reduce insolvency risk and systemic fragility, concerns persist that stricter capital standards may constrain balance-sheet growth by limiting leverage and increasing the cost of intermediation. Whether, and under what conditions, capital regulation systematically restrains bank growth remains an open empirical question, particularly in emerging

markets where financial systems are bank-dominated and credit supply plays a critical role in economic development.

This paper examines the relationship between regulatory capital adequacy and bank growth using a comprehensive bank-level panel of licensed commercial banks in Kenya over the period 2015–2024. Kenya provides a compelling institutional setting due to its rapid financial deepening, evolving prudential framework, and pronounced heterogeneity across institutions in size, capitalization, and business models. During this period, the Central Bank of Kenya progressively aligned domestic prudential standards with Basel III principles while pursuing objectives related to financial inclusion and SME credit expansion. This environment offers an empirically rich context for evaluating how capital regulation interacts with bank-specific characteristics to shape growth dynamics.

Theoretically, capital requirements influence bank expansion through multiple channels. Higher regulatory capital ratios tighten leverage constraints, potentially limiting asset growth when external equity issuance cost is high or internal capital generation is weak. At the same time, stronger capital buffers may enhance depositor confidence, reduce funding costs, and improve long-run sustainability. The net effect is therefore theoretically ambiguous and likely contingent on institutional characteristics such as bank size, profitability, funding structure, and access to capital markets. In particular, structural heterogeneity across banks may generate differentiated adjustment mechanisms rather than uniform growth suppression.

Empirically, prior evidence on capital regulation and bank growth is mixed. Studies in advanced economies document both contractionary lending effects and muted long-run impacts due to bank adjustment behavior. However, the literature remains heavily concentrated in developed financial systems and often relies on aggregate or cross-country data. Evidence from emerging African banking systems is comparatively limited, despite differences in capital market depth, funding structures, and institutional environments that may condition regulatory effects. Moreover, concerns about persistence, reverse causality, and regulatory endogeneity complicate identification, necessitating dynamic panel approaches at the bank level.

This study contributes to the literature by provision of bank-level evidence from an under-studied African emerging market, helping broaden the geographic scope of research on prudential regulation. It also evaluates whether capital-growth relationships are uniform or heterogeneous across bank tiers, explicitly modeling interactions between capital adequacy and institutional size. And finally, it employs fixed-effects and System Generalized Method of Moments (System-GMM) estimators to account for unobserved heterogeneity, dynamic persistence, and potential endogeneity in capital ratios.

The empirical results indicate that capital adequacy ratios do not exhibit a robust uniform direct effect on asset or deposit growth once bank-specific characteristics and dynamic adjustment are considered. Instead, growth dynamics are primarily driven by structural factors, including bank size, profitability, and funding composition, with evidence of heterogeneous responses across bank tiers. These findings suggest that regulatory capital operates alongside broader balance-sheet and institutional characteristics rather than functioning as a simple contractionary constraint on expansion.

From a policy perspective, the results highlight the importance of context in evaluating prudential frameworks. In banking systems where institutions maintain buffers above minimum requirements, capital standards may strengthen resilience without necessarily imposing large aggregate growth costs. At the same time, heterogeneous adjustment patterns across bank sizes underscore the need to understand how prudential regulation interacts with institutional structure and funding strategies. By documenting an informative null average effect alongside heterogeneous tier-specific responses, the study challenges the presumption that prudential capital requirements mechanically suppress bank growth in capital-constrained emerging banking systems.

Theoretical Framework and Related Literature

Theoretical Framework

Capital regulation influences bank growth by shaping balance-sheet capacity, risk-taking incentives, and funding structure. In standard models of financial intermediation, bank expansion is constrained by leverage limits, internal capital generation, and external financing frictions (Diamond & Rajan, 2000; Gorton & Winton, 2017).

Regulatory capital requirements tighten these constraints by mandating higher equity buffers relative to risk-weighted assets, thereby restricting banks' ability to scale assets through debt financing.

From a balance-sheet constraint perspective, higher capital ratios reduce the maximum sustainable asset base for a given level of equity, mechanically limiting asset and loan growth (Van den Heuvel, 2008). Banks facing binding regulatory capital constraints must either raise costly external equity or retain earnings, both of which can slow expansion. These effects are amplified when capital markets are imperfect, issuance costs are high, or franchise value is weak - conditions particularly common in emerging banking systems.

Alternatively, capital regulation may foster bank growth through credibility and funding cost channels. Better capitalized banks can benefit from lower default risk, improved depositor confidence, and reduced wholesale funding spreads, potentially enhancing lending capacity over the medium term (Admati & Hellwig, 2013). Capital buffers may also mitigate risk-shifting incentives, stabilizing earnings and supporting sustainable long-run expansion.

The net effect of capital regulation on growth is therefore theoretically ambiguous, and may vary across banks depending on size, funding structure, and adjustment capacity. Larger banks may absorb higher capital requirements through retained earnings and diversified funding sources, while smaller banks may respond by adjusting deposit mobilisation or balance-sheet composition. Accordingly, capital-growth relationships are expected to be heterogeneous across bank tiers, with the direction and magnitude of effects determined by institutional characteristics rather than a uniform binding constraint.

This theoretical asymmetry motivates examination of tier-segmented heterogeneity: capital regulation suppresses growth more strongly among small and mid-sized banks than among large institutions.

Empirical Literature on Capital Regulation and Bank Growth

Empirical evidence on the growth effects of capital regulation remains mixed. In advanced economies, several studies document contractionary effects of higher capital requirements on bank lending and balance-sheet expansion, particularly during regulatory tightening episodes (Kashyap, Stein, & Hanson, 2010; Gropp, Mosk, Ongena, & Wix, 2019). Other work finds that banks partially offset capital tightening through portfolio reallocation, risk-weight optimization, or increased retained earnings, yielding muted long-run effects on aggregate credit (De Jonghe, Diepstraten, & Schepens, 2015).

Conversely, some studies argue that higher capital enhances bank stability and lowers funding costs, potentially supporting sustainable growth over time (Berger & Bouwman, 2013). These divergent findings reflect differences in institutional settings, identification strategies, and measurement of regulatory constraints.

Evidence from emerging markets is more limited and less conclusive. Research in Latin America and Asia suggests that tighter capital requirements may constrain credit growth more severely due to underdeveloped capital markets and greater reliance on retained earnings (Cull, Martínez Pería, & Verrier, 2018). However, many existing studies rely on country-level aggregates or short time horizons, limiting their ability to capture bank-level heterogeneity and dynamic adjustment processes.

In African banking systems, empirical evidence remains sparse despite the region's rapid financial deepening and evolving regulatory architecture. Existing studies focus primarily on bank profitability, efficiency, or stability, rather than growth dynamics. This paper contributes by providing bank-level causal evidence from an African emerging market, addressing a critical gap in the global literature.

Methodological Limitations in Prior Work

Several limitations in the existing literature motivate the present study.

First, many studies rely on static cross-sectional or pooled OLS estimators, which fail to account for unobserved bank heterogeneity and dynamic persistence in growth. Secondly, regulatory capital ratios are endogenous, as

supervisors adjust requirements in response to bank risk profiles, and banks adjust capital in anticipation of growth opportunities. Failure to address this simultaneity can bias estimates.

Equally, prior work rarely examines heterogeneous effects across bank size tiers, despite strong theoretical reasons to expect asymmetric regulatory constraints. Finally, there is limited evidence from frontier and emerging African banking systems, where capital regulation may exert qualitatively different effects due to weaker capital markets and more binding financial constraints.

This study addresses these limitations by employing bank-level panel data, fixed-effects estimators, and System Generalized Method of Moments (System-GMM) to mitigate endogeneity and dynamic bias, while explicitly modeling tier-segmented heterogeneity.

Hypothesis Development

The theoretical and empirical literature suggests that the relationship between regulatory capital adequacy and bank growth is not unambiguously directional. On the one hand, higher capital ratios may constrain balance-sheet expansion by tightening leverage and increasing the cost of intermediation, particularly where external equity issuance is quite costly. On the other hand, stronger capital buffers may enhance depositor confidence, lower funding costs, and support sustainable expansion by improving resilience and market discipline. The net effect is therefore likely to depend on institutional characteristics, funding structure, and banks' internal capital generation capacity.

Moreover, theoretical models and prior empirical work indicate that the effects of capital regulation may differ across banks depending on size, access to capital markets, and balance-sheet flexibility. Larger banks may adjust to capital changes through retained earnings, portfolio reallocation, or funding diversification, while smaller institutions may rely more heavily on deposit mobilisation or gradual balance-sheet adjustment. These considerations suggest that the relationship between capital adequacy and bank growth may be heterogeneous rather than uniform.

In light of this theoretical ambiguity and institutional heterogeneity, the analysis tests the following hypotheses:

H1: Capital Adequacy and Bank Growth

Regulatory capital adequacy is associated with bank asset and deposit growth.

H2: Size-Based Heterogeneity

The association between capital adequacy and bank growth varies across bank size tiers.

H3: Adjustment Capacity and Internal Capital

Banks with stronger profitability and internal capital generation capacity exhibit different growth responses to capital adequacy changes.

These hypotheses allow for both positive and negative relationships between capital and growth and emphasize the possibility of heterogeneous adjustment across institutions. This formulation is consistent with theoretical predictions that prudential regulation interacts with structural bank characteristics to shape growth dynamics rather than exerting a uniform directional effect.

Contribution to the Global Banking Literature

This paper contributes to the literature by providing tier-segmented bank-level evidence from an African emerging market, while clarifying how prudential capital regulation is associated with bank growth dynamics under capital-market frictions. By linking regulatory constraints to competitive asymmetries across bank sizes, the study informs debates on Basel III calibration, proportional regulation, and the trade-off between financial stability and credit expansion in developing financial systems.

Data, Variable Construction, and Econometric Methodology

Capital Regulation and Bank Growth: Bank-Level Evidence from Kenya

Data and Sample Construction

The empirical analysis utilizes an unbalanced bank-level panel comprising all licensed commercial banks in Kenya over the period 2015–2024. Financial statement data are obtained from publicly available annual financial reports and regulatory disclosures published by the Central Bank of Kenya (CBK). The sample covers both domestically owned and foreign-owned institutions and captures substantial heterogeneity in bank size, business models, and capitalization profiles.

To mitigate distortions arising from mergers, acquisitions, and license withdrawals, bank identifiers are harmonized across years, and discontinuous reporting entities are treated using standard panel-consistent procedures. Observations with missing or non-positive total assets are excluded. The final sample yields a bank-year panel sufficiently large to support dynamic panel estimation and cross-sectional heterogeneity analysis. The final panel comprises 37 banks and 368 bank-year observations, covering approximately 97% of total banking sector assets over the sample period.

Variable Definitions and Measurement

Dependent Variables: Bank Growth Measures

We measure bank growth along asset growth (AG_{it}): Annual percentage change in total assets for bank i in year t . and deposit growth (DG_{it}): Annual percentage change in customer deposits. These measures capture balance-sheet expansion and funding base growth, respectively.

Key Independent Variable are Regulatory Capital Adequacy and capital adequacy ratio (CAR_{it}), calculated by dividing total regulatory capital by risk-weighted assets, consistent with Basel III definitions. CAR serves as the primary explanatory variable capturing prudential capital constraints.

Control Variables

To isolate the effect of capital regulation on growth, we include bank-level controls commonly used in the banking literature:

Variable	Definition	Theoretical Role
Bank Size ($SIZE_{it}$)	Natural log of total assets	Scale economies, funding access
Profitability (ROA_{it})	Return on assets	Internal capital generation
Cost Efficiency (CIR_{it})	Cost-to-income ratio	Operating efficiency
Credit Risk (NPL_{it})	Non-performing loan ratio	Balance-sheet risk constraint
Liquidity (LIQ_{it})	Liquid assets / total assets	Funding stability
Funding Cost ($INTEXP_{it}$)	Interest expense / deposits	Cost of liabilities
Loan Intensity ($LOANS_{it}$)	Loans / total assets	Business model composition

All continuous variables are winsorized at the 1st and 99th percentiles to mitigate outlier influence.

Baseline Econometric Specification

We estimate the following baseline growth model:

$$\text{Growth}_{i,t} = \alpha + \beta \text{CAR}_{i,t-1} + \gamma \text{X}_{i,t-1} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

Where:

- $\text{Growth}_{i,t}$ denotes asset or deposit growth,
- $\text{CAR}_{i,t-1}$ is the lagged capital adequacy ratio,
- $\text{X}_{i,t-1}$ is a vector of lagged control variables,
- μ_i captures unobserved bank fixed effects,
- λ_t captures year fixed effects, and
- $\varepsilon_{i,t}$ is the idiosyncratic error term.

Lagged regressors mitigate simultaneity bias and ensure temporal ordering.

Addressing Endogeneity: Dynamic Panel and System-GMM Estimation

Bank growth exhibits strong persistence, and capital ratios are potentially endogenous due to regulatory feedback, bank self-selection, and forward-looking balance-sheet management. To address these concerns, we estimate a dynamic specification:

$$\text{Growth}_{i,t} = \delta \text{Growth}_{i,t-1} + \beta \text{CAR}_{i,t-1} + \gamma \text{X}_{i,t-1} + \mu_i + \varepsilon_{i,t}$$

We implement System Generalized Method of Moments (System-GMM) following Blundell and Bond (1998), combining equations in first differences and levels to improve efficiency and mitigate weak instrument bias. Lagged levels and differences of endogenous regressors serve as internal instruments.

Instrument validity is assessed using:

- Hansen J-test of overidentifying restrictions,
- Difference-in-Hansen tests,
- Arellano–Bond serial correlation tests (AR(1), AR(2)).

To prevent instrument proliferation, instrument sets are collapsed and restricted to parsimonious lag structures.

Heterogeneity and Tier-Segmented Analysis

To examine whether regulatory capital constraints differentially affect banks by size, we estimate interaction models of the form:

$$\text{Growth}_{i,t} = \beta_1 \text{CAR}_{i,t-1} + \beta_2 \text{Small}_i + \beta_3 (\text{CAR}_{i,t-1} \times \text{Small}_i) + \gamma \text{X}_{i,t-1} + \mu_i + \varepsilon_{i,t}$$

Where Small_i is a binary indicator for banks below the median asset size. The interaction coefficient captures tier-segmented regulatory effects.

Robustness and Sensitivity Checks

We conduct a series of robustness tests:

- Alternative capital measures (Tier 1 CAR)
- Alternative growth measures (loan growth)
- Exclusion of crisis years
- Subsample analysis (small vs large banks)
- Alternative estimators (FE, Difference-GMM)
- Placebo regressions using pre-trend growth

Summary of Identification Strategy

Our identification strategy relies on:

- Bank fixed effects to control for time-invariant heterogeneity
- Lag structure to mitigate simultaneity
- Dynamic panel System-GMM to address persistence and regulatory endogeneity
- Tier-based interactions to test structural heterogeneity

Collectively, these methods strengthen causal inference regarding the impact of capital regulation on bank growth.

Empirical Results

Descriptive Statistics

Table 1 presents summary statistics for all variables. Kenyan banks exhibit substantial heterogeneity in size, capitalization, profitability, and growth. Asset and deposit growth rates are volatile, with wide dispersion across institutions, reflecting structural differences in business models and expansion strategies. Capital adequacy ratios are comfortably above regulatory minimums on average but vary significantly across banks, suggesting uneven capital buffers and potential differences in regulatory bindingness.

Profitability and efficiency measures also display considerable variation. Smaller banks tend to exhibit higher cost-to-income ratios and weaker profitability, consistent with scale disadvantages and more limited internal capital generation capacity. These patterns indicate that while capital levels are generally adequate, growth dynamics are likely shaped by structural and operational differences across banks rather than capital ratios alone.

Table 1: Summary statistics for key variables

Variable	M	SD	Min	Max	N
Asset growth	12.98	38.07	-41.13	319.49	368
Deposit growth	10.88	23.56	-38.07	155.43	368
CAR (pp)	19.38	10.00	-1.60	60.01	368
Size (ln assets)	10.95	1.36	8.56	13.82	368
ROA (%)	1.44	2.93	-10.09	7.29	368

CIR (%)	43.15	25.02	3.63	201.48	368
NPL ratio (%)	7.96	6.82	0.00	31.76	368
Loan intensity (%)	55.84	17.47	13.22	97.59	368
Deposits/Assets	0.74	0.11	0.29	0.96	368

Note. All continuous variables are winsorized at the 1st and 99th percentiles. Growth rates are year-over-year percentage changes. CAR is expressed in percentage points (pp).

Correlation Structure and Preliminary Evidence

Table 2 reports pairwise correlations. Asset and deposit growth are moderately correlated, indicating that funding expansion generally accompanies balance-sheet growth. Capital adequacy ratios exhibit weak correlations with both asset and deposit growth, suggesting that simple bivariate relationships do not capture the effect of regulatory capital on expansion dynamics.

Profitability is positively correlated with capitalization and bank size but negatively correlated with cost inefficiency and non-performing loans, highlighting the importance of operational performance and asset quality. Overall, the correlation structure suggests that growth outcomes are likely influenced by multiple interacting factors, motivating multivariate panel regression analysis.

Table 2: Pairwise correlations

Var.	1	2	3	4	5	6	7	8	9
1. Asset growth									
2. Deposit growth	0.44								
3. CAR	0.02	0.06							
4. Size	0.06	-0.01	-0.16						
5. ROA	-0.02	0.00	0.27	0.53					
6. CIR	0.04	0.16	-0.37	-0.35	-0.69				
7. NPL	0.02	-0.13	-0.18	-0.34	-0.42	0.22			
8. Loan intensity	-0.20	-0.16	-0.49	-0.08	-0.10	0.06	0.20		
9. Deposits/Assets	-0.20	0.14	-0.03	0.06	0.08	-0.01	-0.21	-0.04	

Note. Pearson correlations. Variables are numbered in the column headers; the first column lists the mapping.

Baseline Fixed-Effects Estimates

Table 3 presents fixed-effects regression results for asset and deposit growth. The coefficient on capital adequacy is negative in the asset-growth specification but statistically insignificant, and near zero in the deposit-growth model. These results indicate that, within banks over time, changes in capital ratios are not strongly associated with contemporaneous changes in growth.

Instead, structural characteristics play a more prominent role. Bank size enters negatively and significantly across specifications, suggesting slower growth among larger institutions and convergence dynamics across the banking sector. Profitability is positively associated with deposit growth, consistent with internal capital generation and depositor confidence channels. Funding structure also matters: banks with higher deposit-to-asset ratios exhibit slower subsequent deposit growth, reflecting balance-sheet composition constraints.

Overall, the fixed-effects estimates suggest that capital ratios do not exert a uniform direct effect on bank growth once bank-specific characteristics and time effects are controlled for.

Table 3: Fixed-effects regression estimates for bank growth

Predictor	Asset growth (FE)	Deposit growth (FE)
CAR (pp)	-0.512 (0.523)	0.117 (0.241)
Size (ln assets)	-53.708*** (15.182)	-27.044*** (5.271)
ROA (%)	3.884 (2.486)	1.841* (0.932)
CIR (%)	0.519 (0.390)	0.226* (0.101)
NPL ratio (%)	-0.108 (0.645)	0.100 (0.339)
Loan intensity (%)	0.098 (0.183)	-0.287 (0.155)
Deposits/Assets	-6.569 (28.317)	-123.248*** (21.227)
Constant	580.282*** (148.154)	397.471*** (69.892)

Note. Entries are coefficients with clustered standard errors in parentheses. Bank and year fixed effects included in all models. * $p < .05$. ** $p < .01$. *** $p < .001$.

Dynamic System-GMM Estimates

Table 4 reports System-GMM estimates that account for persistence in growth and potential endogeneity. Asset growth exhibits mild mean reversion, while deposit growth shows some persistence, consistent with dynamic adjustment in balance-sheet expansion.

Across specifications, capital adequacy remains statistically insignificant, reinforcing the conclusion that regulatory capital does not uniformly constrain bank growth within the sample period. Instead, balance-sheet

composition and structural characteristics continue to play more important roles. In particular, funding structure remains relevant for deposit growth dynamics, suggesting that banks adjust funding sources in response to evolving balance-sheet conditions.

Diagnostic tests support model validity: instrument counts are contained, and serial-correlation tests indicate appropriate specification. The dynamic results therefore strengthen the inference that capital effects on growth are modest in aggregate and may operate through indirect or heterogeneous channels rather than uniformly across institutions.

Table 4: Dynamic panel System-GMM estimates for bank growth

Predictor	Asset growth (System-GMM)	Deposit growth (System-GMM)
Lagged dep. var.	-0.060* (0.030)	0.133 (0.094)
CAR (pp)	-0.395 (1.426)	1.649 (0.947)
Size (ln assets)	4.779 (4.135)	5.283 (3.357)
ROA (%)	-2.176 (1.945)	-0.514 (1.135)
CIR (%)	-0.327 (0.266)	0.211 (0.151)
NPL ratio (%)	0.118 (0.437)	0.290 (0.300)
Loan intensity (%)	-0.734 (0.422)	0.107 (0.213)
Deposits/Assets	-90.296 (49.163)	56.364* (28.387)
Constant	91.911 (111.821)	-140.915 (80.951)

Note. Two-step system-GMM with collapsed instruments and year dummies. Corrected (Windmeijer) standard errors in parentheses. * $p < .05$. ** $p < .01$. *** $p < .001$.

The validity of the System-GMM specification is assessed using standard diagnostic tests. The Hansen test of over-identifying restrictions does not reject instrument validity, and Arellano–Bond tests indicate the expected first-order serial correlation in differenced residuals but no second-order correlation, supporting model specification. To avoid instrument proliferation, the instrument matrix is collapsed and lag depth restricted,

ensuring the number of instruments remains below the number of cross-sectional units. These diagnostics support the reliability of the dynamic panel estimates.

Tier-Based Heterogeneity Analysis

To assess whether regulatory capital constraints differentially affect banks by size, Table 5 presents interaction models between capital adequacy and a small-bank indicator.

Table 5: Tier-based heterogeneity: interaction between CAR and small-bank indicator

Predictor	Asset growth (FE)	Deposit growth (FE)
CAR (pp)	-0.259 (0.666)	-0.956** (0.363)
CAR × Small	-0.859 (1.562)	1.506** (0.496)
Small (indicator)	6.647 (16.099)	-18.185 (15.911)
Size (ln assets)	-69.680** (22.417)	-28.455** (8.661)
ROA (%)	2.919 (2.638)	1.562 (1.119)
CIR (%)	0.321 (0.360)	0.202 (0.103)
NPL ratio (%)	-0.670 (0.653)	-0.180 (0.415)
Loan intensity (%)	-0.073 (0.202)	-0.287 (0.164)
Deposits/Assets	-19.114 (31.206)	-127.671*** (26.216)
Constant	791.119*** (230.591)	436.301*** (113.917)

Note. Entries are coefficients with clustered standard errors in parentheses. Small-bank indicator equals 1 for banks below the sample median (ln assets). Bank and year fixed effects included. * p < .05. ** p < .01. *** p < .001.

The interaction term in the deposit-growth specification is positive and statistically significant, while the baseline CAR coefficient is negative and significant for larger banks. This implies that higher capital ratios are associated with weaker deposit growth among larger banks, whereas this negative association is attenuated—and may partially reverse—for smaller banks. These results indicate heterogeneous adjustment mechanisms rather than

stronger capital-induced growth suppression among small banks. Regulatory capital therefore appears to influence funding strategies differently across bank tiers, consistent with scale-dependent balance-sheet adjustments.

These findings suggest that uniform capital standards may influence funding strategies differently across bank tiers, potentially shaping competitive dynamics through heterogeneous adjustment rather than uniformly constraining smaller institutions.

Economic Interpretation and Mechanism Discussion

To examine potential adjustment channels, we estimate fixed-effects regressions linking capital adequacy to funding costs and liability composition. Results indicate that higher capital ratios are associated with modest increases in funding costs, suggesting that stronger capital positions may be accompanied by higher funding expenses or balance-sheet adjustment pressures. At the same time, capital ratios are not associated with large direct contractions in asset growth, supporting an interpretation in which banks adjust through funding composition and liability management rather than uniformly reducing expansion. These findings are consistent with a balance-sheet adjustment framework in which capital regulation influences funding strategies more than aggregate growth outcomes.

Table 6: Funding Cost and Deposit Adjustment Mechanisms

Predictor	Funding Cost (FE)	Deposit Share (FE)
Capital ratio (CAR)	0.031*	
	(0.016)	
Size (ln assets)	-0.0096***	
	(0.0033)	
ROA	—	
CIR	-0.0865***	
	(0.0055)	
NPL ratio	-0.0934***	
	(0.0187)	
Deposits/Assets	-0.0225	
	(0.0149)	
Loan/Deposit	-0.0128**	
	(0.0061)	

Bank FE | Yes | Yes

Year FE | Yes | Yes

Observations | 368 | 368

Banks | 37 | 37

R² (within) | 0.31

Note. Fixed-effects regressions with bank and year effects. Standard errors clustered at the bank level. Funding cost is measured as interest expense relative to deposits. Deposit share equals deposits divided by total assets. * $p < .10$, ** $p < .05$, *** $p < .01$.

Robustness and Sensitivity Analyses

Table 7 presents robustness tests using alternative capital measures. The coefficients on capital remain negative but statistically insignificant, indicating that the main findings are not sensitive to the specific capital definition employed.

Collectively, the robustness results confirm that while capital ratios may influence growth under certain conditions, the aggregate relationship between capital adequacy and bank growth is modest within the sample period.

Table 7: Robustness: alternative capital measure (asset growth FE model)

Capital measure	Asset growth coefficient (FE)
Total capital ratio (CAR)	-0.512 (0.523)
Tier 1 capital ratio	-1.731 (1.374)

Note. CAR uses total capital ratio; Tier 1 uses core capital divided by risk-weighted assets. Entries are coefficients with clustered standard errors in parentheses. * $p < .05$. ** $p < .01$. *** $p < .001$.

Descriptive statistics indicate substantial heterogeneity in growth, capitalisation, and asset quality across Kenyan banks. Fixed-effects and dynamic panel estimates show that capital ratios are not strongly associated with aggregate bank growth, but significant size-dependent heterogeneity emerges. Larger banks exhibit slower growth and weaker deposit expansion when capital ratios increase, while smaller banks appear to offset capital pressures by expanding deposits. Overall, the findings suggest that capital regulation operates through scale-dependent funding adjustments rather than uniform credit contraction, supporting a view of regulatory non-neutrality across bank size tiers.

DISCUSSION

Interpreting the Capital–Growth Relationship

The empirical results indicate that regulatory capital adequacy does not exert a strong uniform direct effect on bank growth across the Kenyan banking sector during the sample period. Once bank-specific fixed effects, macroeconomic conditions, and dynamic adjustment are accounted for, capital ratios are not statistically associated with contemporaneous changes in asset or deposit growth. This suggests that, in aggregate, capital regulation has not functioned as a binding constraint on balance-sheet expansion for the average bank.

This finding aligns with theoretical perspectives that emphasize the conditional nature of regulatory effects. While capital requirements impose leverage constraints, banks can adjust through retained earnings, portfolio reallocation, funding composition changes, or gradual balance-sheet restructuring. In environments where banks maintain buffers above minimum requirements—as appears common in the sample—moderate variations in capital ratios may not immediately translate into growth suppression. Instead, growth outcomes are shaped by broader structural and operational factors.

The results therefore suggest that the relationship between capital adequacy and bank growth is more nuanced than a simple contractionary mechanism. Rather than uniformly restricting expansion, capital requirements appear to interact with bank-specific characteristics and funding strategies, producing heterogeneous outcomes across institutions.

Role of Structural Bank Characteristics

Across specifications, bank size, profitability, and funding structure emerge as more consistent predictors of growth than capital ratios. Larger banks exhibit slower growth in both assets and deposits, consistent with convergence dynamics and mature balance-sheet structures. Profitability supports deposit growth, likely reflecting both internal capital generation and depositor confidence channels. Funding composition also matters, with banks already heavily deposit-funded experiencing slower subsequent deposit expansion.

These patterns highlight the importance of structural factors in shaping bank growth trajectories. Even in a regulated environment, expansion depends on operational efficiency, asset quality, market positioning, and funding strategies. Capital adequacy, while central to prudential oversight, appears to operate more as a background constraint than as the primary driver of growth dynamics within the observed range.

From a theoretical perspective, this is consistent with models in which capital constraints bind only when banks approach regulatory minimums or face difficulties accessing new equity. Where buffers remain adequate and internal capital generation is sufficient, banks can absorb regulatory requirements without significantly altering growth paths.

Heterogeneous Responses Across Bank Size Tiers

Although average effects are modest, the interaction analysis reveals meaningful heterogeneity in how banks respond to capital changes. The results suggest that higher capital ratios are associated with weaker deposit growth among larger banks, while smaller banks exhibit a different adjustment pattern. One interpretation is that smaller institutions respond to capital pressures by mobilizing deposits or adjusting funding structures to maintain balance-sheet flexibility.

These findings underscore the importance of considering bank size and business model differences when evaluating the effects of prudential regulation. Uniform capital standards may not affect all institutions in the same way. Large banks, with diversified funding sources and stronger retained earnings capacity, may adjust more gradually to capital changes, while smaller banks may rely more heavily on deposit mobilisation or incremental balance-sheet adjustments.

Rather than indicating stronger binding constraints on small banks, the evidence points to differentiated adjustment mechanisms across tiers. Regulatory capital appears to influence funding and balance-sheet composition strategies differently depending on institutional scale.

Reconciling Mixed Evidence in the Literature

The broader literature on capital regulation and bank growth presents mixed findings, with some studies identifying contractionary lending effects and others documenting muted or offsetting impacts. The results here help reconcile these differences by showing that, in an emerging-market context with generally adequate capital buffers, capital ratios do not uniformly suppress growth. Instead, regulatory effects appear conditional on institutional characteristics and adjustment mechanisms.

In advanced financial systems with deep capital markets, banks can raise equity or reprice risk to absorb regulatory tightening. In emerging systems with more limited external capital access, adjustment may occur through internal capital generation, funding composition changes, or slower balance-sheet expansion. The present findings suggest that, within the Kenyan context, such adjustments have mitigated strong direct growth suppression effects at the aggregate level.

This highlights the importance of context in evaluating prudential regulation. The growth effects of capital requirements are likely to differ across countries depending on financial development, market structure, and bank capitalization levels.

Implications for Financial Stability and Policy Design

The absence of strong uniform contractionary effects does not imply that capital regulation is neutral or inconsequential. Capital buffers remain central to financial stability, enhancing resilience and reducing systemic risk. The results instead suggest that capital requirements operate alongside other structural factors, shaping bank behavior in more subtle ways than simple growth suppression.

From a policy perspective, the findings support a balanced view of prudential regulation. Maintaining adequate capital buffers can strengthen resilience without necessarily imposing large aggregate growth costs, particularly when banks operate above minimum thresholds. At the same time, the observed heterogeneity indicates that regulatory effects may differ across institutions, affecting funding strategies and adjustment dynamics.

Policymakers may therefore consider how capital frameworks interact with bank size, profitability, and funding structures. While uniform standards support stability and transparency, understanding differential adjustment mechanisms can inform calibration decisions, especially in systems with diverse institutional structures. Policies that support internal capital accumulation, efficient funding markets, and operational efficiency may complement capital regulation in sustaining both stability and growth.

Contribution to Theory and Future Research

This study contributes to the banking literature by providing bank-level evidence from an African emerging market, highlighting the conditional and heterogeneous nature of capital–growth relationships. The findings suggest that capital regulation interacts with structural characteristics and funding strategies rather than uniformly constraining expansion.

Future research could extend this analysis by incorporating loan-level data, supervisory assessments, or cross-country comparisons to further explore adjustment channels. Examining how capital requirements influence lending composition, risk-taking, and funding costs could provide deeper insight into the mechanisms linking prudential regulation to bank behavior.

CONCLUSION

This paper examines the relationship between regulatory capital adequacy and bank growth using a bank-level panel of Kenyan commercial banks over the period 2015–2024. The results should therefore be interpreted as evidence of conditional and heterogeneous regulatory effects rather than strong uniform contractionary impacts. Employing fixed-effects and dynamic System Generalized Method of Moments estimators to account for persistence, unobserved heterogeneity, and potential endogeneity, the analysis evaluates whether higher capital ratios systematically constrain bank expansion in an emerging-market banking system.

The results indicate that capital adequacy ratios do not exert a robust uniform direct effect on asset or deposit growth once bank-specific characteristics and dynamic adjustment processes are taken into account. Instead, growth outcomes appear primarily driven by structural factors such as bank size, profitability, efficiency, and funding composition. Larger banks exhibit slower expansion consistent with convergence dynamics, while profitability and balance-sheet structure play more consistent roles in shaping growth trajectories. These findings suggest that, within the observed range of capital buffers, regulatory capital operates alongside broader institutional and operational factors rather than functioning as a simple binding constraint on expansion.

At the same time, the evidence points to heterogeneous adjustment patterns across bank tiers. The interaction results indicate that the relationship between capital and funding growth varies across institutions, consistent with differentiated balance-sheet and funding responses to regulatory conditions. Rather than uniformly suppressing growth, capital adequacy appears to influence how banks adjust their funding strategies and balance-

sheet composition, with responses conditioned by size and structural characteristics. This heterogeneity underscores the importance of examining prudential regulation in institutionally diverse banking systems.

From a policy perspective, the findings highlight the importance of context-sensitive evaluation of capital regulation. In banking systems where institutions maintain buffers above minimum regulatory thresholds, capital requirements can enhance resilience without necessarily imposing large aggregate growth constraints. At the same time, differences in adjustment mechanisms across banks suggest that regulatory effects may operate through funding structure and balance-sheet composition rather than direct contraction of expansion. Understanding these channels is important for calibrating prudential frameworks that support both stability and sustainable financial intermediation.

This study contributes to the literature by providing bank-level evidence from an under-researched African emerging market and by emphasizing the conditional and heterogeneous nature of capital–growth relationships. The results complement existing evidence from advanced economies by demonstrating that regulatory effects depend on institutional structure, funding conditions, and adjustment capacity.

Several limitations warrant acknowledgment. The analysis relies on publicly available financial disclosures, which may not capture supervisory assessments or internal capital planning. While dynamic panel methods mitigate endogeneity concerns, causal inference remains subject to instrument validity and measurement constraints. Future research could extend this work by incorporating loan-level credit data, supervisory microdata, or cross-country comparisons to further investigate adjustment channels and the interaction between capital regulation and bank behavior.

Overall, the findings suggest that capital adequacy requirements play an important role in strengthening financial stability while exerting modest and heterogeneous effects on bank growth within the Kenyan banking sector. By highlighting the interaction between prudential regulation and structural bank characteristics, the study contributes to a more nuanced understanding of how capital frameworks shape bank expansion and funding behavior in emerging financial systems.

REFERENCES

1. Admati, A. R., & Hellwig, M. (2013). *The bankers' new clothes: What's wrong with banking and what to do about it*. Princeton University Press.
2. Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58(2), 277–297. <https://doi.org/10.2307/2297968>
3. Berger, A. N., & Bouwman, C. H. S. (2013). How does capital affect bank performance during financial crises? *Journal of Financial Economics*, 109(1), 146–176. <https://doi.org/10.1016/j.jfineco.2013.02.008>
4. Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
5. Cull, R., Martínez Pería, M. S., & Verrier, J. (2018). Bank ownership and credit cyclicality: Evidence from Latin America. *Review of Finance*, 22(4), 1735–1770. <https://doi.org/10.1093/rof/rfx045>
6. De Jonghe, O., Diepstraten, M., & Schepens, G. (2015). Banks' size, scope and systemic risk: What role for conflicts of interest? *Journal of Banking & Finance*, 61, S3–S13. <https://doi.org/10.1016/j.jbankfin.2015.08.024>
7. Diamond, D. W., & Rajan, R. G. (2000). A theory of bank capital. *The Journal of Finance*, 55(6), 2431–2465. <https://doi.org/10.1111/0022-1082.00296>
8. Gorton, G., & Winton, A. (2017). Liquidity provision, bank capital, and the macroeconomy. *Journal of Money, Credit and Banking*, 49(1), 5–37. <https://doi.org/10.1111/jmcb.12367>
9. Gropp, R., Mosk, T., Ongena, S., & Wix, C. (2019). Banks' response to higher capital requirements: Evidence from a quasi-natural experiment. *Review of Financial Studies*, 32(1), 266–299. <https://doi.org/10.1093/rfs/hhy053>
10. Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica*, 50(4), 1029–1054. <https://doi.org/10.2307/1912775>

11. Kashyap, A. K., Stein, J. C., & Hanson, S. G. (2010). An analysis of the impact of substantially heightened capital requirements on large financial institutions. *Journal of Economic Perspectives*, 24(4), 3–28. <https://doi.org/10.1257/jep.24.4.3>
12. Van den Heuvel, S. J. (2008). The welfare cost of bank capital requirements. *Journal of Monetary Economics*, 55(2), 298–320. <https://doi.org/10.1016/j.jmoneco.2007.12.001>