Bank Size and Bank Expansion in Kenya As Measured By Asset and Deposit Growth: Evidence from Panel Financial Data (2015–2024)

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ABSTRACT

This study examines whether and why smaller commercial banks in Kenya expand more slowly than larger banks, using tier-segmented panel data (Tier I versus Tier IV) over 2015–2024. Bank expansion is proxied by annual asset and deposit growth. Explanatory variables capture size (log assets), cost efficiency (cost-to-income ratio), funding cost (interest expense-to-deposits proxy), asset quality (NPL ratio), and capital adequacy (core capital-to-RWA). Across pooled OLS models with heteroskedasticity-robust (HC3) standard errors, capital adequacy emerges as the most statistically robust and economically meaningful correlate of slower expansion: a one-percentage-point increase in the core-capital ratio is associated with approximately 3.29 percentage-point lower asset growth and 4.55 percentage-point lower deposit growth. Size is directionally positive but imprecisely estimated once controls are included, while efficiency does not mediate the size–growth association. The results highlight a growth–prudence trade-off in which prudential buffers materially constrain balance-sheet expansion for small banking segments. The paper contributes rare tier-segmented evidence from an African emerging market and offers implications for proportional regulation, capital calibration, and consolidation–competition trade-offs in Kenya.

Keywords: bank size; bank growth; capital adequacy; cost efficiency; deposit growth; Kenya; emerging markets.

INTRODUCTION

Bank expansion—manifested in balance-sheet growth, deposit mobilization, and distribution reach—is central to financial intermediation and inclusion in emerging markets. Yet expansion trajectories are uneven: larger banks often benefit from economies of scale, more diversified funding, stronger governance and risk systems, and superior market access, while smaller banks face higher unit operating costs, more volatile funding, and relatively heavier fixed compliance burdens. In Kenya, these differences coincide with a policy-relevant question: do small banks expand slowly because they are inefficient and constrained on funding and asset quality, or because prudential buffers mechanically bind growth through risk-weighted assets and capital planning? This paper addresses this question using tier-segmented panel data for 2015–2024 and a hypothesis-driven empirical framework linking size to growth through efficiency, funding cost, asset quality, and prudential capital.

LITERATURE REVIEW AND HYPOTHESES

Theoretical foundations

The analysis builds on five complementary perspectives. (i) Economies of scale predict declining average costs with size, enabling larger banks to expand more cheaply and to invest in technology and risk systems. (ii) The resource-based view emphasizes that size proxies for strategic resources—capital, organizational capabilities,

and managerial expertise—that shape competitive positioning and growth. (iii) Financial intermediation theory highlights balance-sheet constraints: growth depends on mobilizing stable deposits and funding at reasonable cost while maintaining asset quality. (iv) Market-power theories imply that larger banks may secure cheaper funding and franchise rents, enabling safer expansion. (v) Prudential regulation introduces a capital constraint: higher core-capital ratios may reflect either stronger buffers or tighter supervisory expectations, and can trade off against balance-sheet growth when risk-weighted assets rise with expansion.

Global evidence, contradictions, and methodological critique

Empirical evidence on size and bank growth is mixed. In the U.S., scale economies and X-efficiency have long been linked to cost advantages for larger banks, supporting faster expansion through lower operating costs and superior production technology (Berger & Mester, 1997). Cross-country work shows that the funding model and risk–return trade-offs shape bank behavior, with capital structure and supervisory stance conditioning growth and risk-taking (Demirgüç-Kunt & Huizinga, 2010). In emerging markets, tight financing conditions and weaker contract enforcement can amplify constraints on smaller institutions (Beck, Demirgüç-Kunt, & Maksimovic, 2005). More recent evidence from an emerging-market capital-buffer reform suggests that higher capital requirements can temporarily reduce credit growth, with heterogeneous effects across banks and states of the cycle (Fang et al., 2022).

Contradictions across countries arise because scale advantages are not universal: niche banks may grow rapidly by specializing, but such strategies may involve higher risk, weaker funding stability, or supervisory intervention. Methodologically, prior work often differs along three dimensions that can change conclusions: (i) growth measurement (asset versus loans versus deposits), (ii) model choice (pooled OLS versus fixed effects versus dynamic GMM), and (iii) identification strategy for endogeneity between growth, risk, and capital buffers. Dynamic panel estimators such as Arellano–Bond GMM address persistence and endogeneity in growth processes (Arellano & Bond, 1991), but require sufficiently large N and careful instrument control (Judson & Owen, 1997). In small panels or aggregated series, transparent baseline estimators with robust inference are often preferred, while causal claims must be tempered.

Kenyan and regional evidence and the research gap

Kenya-specific evidence points to binding prudential and operational constraints for smaller institutions. Banking industry reports document persistent tier differences in asset quality, cost structure, and capitalization, consistent with asymmetric capacity to absorb shocks and finance growth (Kenya Bankers Association, 2025; Central Bank of Kenya, various years). Academic work on Kenyan banks has also shown that capital adequacy and size are associated with core intermediation outcomes such as liquidity and performance, suggesting that prudential buffers matter for operating strategy (e.g., Nyaundi, 2015). However, much of the local literature evaluates profitability rather than expansion, uses bank-level panels without explicitly testing growth channels, or does not integrate size, efficiency, funding costs, asset quality, and capital adequacy in a single hypothesis-driven design.

This paper contributes to global banking literature by providing rare tier-segmented evidence from an African emerging market, highlighting how prudential capital constraints condition bank growth. It also clarifies which mechanisms—efficiency, funding costs, asset quality, or capital buffers—best explain why small banks expand more slowly than large banks in Kenya.

Table 1. Empirical literature matrix (global, regional, and Kenyan evidence)

Study	Context	Data/Sample	Method	Core finding	Link
Berger & Mester (1997)	United States	Commercial banks	Efficiency/scale decomposition	Scale economies and X-efficiency confer cost advantages that can support faster expansion among larger banks.	H1, H2

Demirgüç-Kunt & Huizinga (2010)	Cross-country	80+ countries	Panel regression	Funding structure and risk–return trade-offs shape growth; prudential stance can dampen expansion.	H3, H5
Beck et al. (2005)	Developing economies	Multi-country	Cross-country econometrics	Financing/legal constraints bind more strongly for smaller institutions in developing contexts.	H1, H3
Fang et al. (2022)	Emerging market (Peru)	Bank-level quarterly panel	Capital-buffer quasi-experiment	Higher capital requirements reduce credit growth temporarily; effects vary by bank characteristics.	H5
Nyaundi (2015)	Kenya	Commercial banks	Panel regression	Capital adequacy and bank size significantly affect core balance-sheet outcomes (liquidity), consistent with prudential constraints.	H1, H5
Basel Committee (2019)	Global regulation	Survey of jurisdictions	Policy survey	Proportionality regimes often relax requirements for small/simple banks using thresholds and supervisory judgement.	Policy link

Hypotheses

H1: Bank size is positively associated with bank expansion (asset and deposit growth).

H2: Cost efficiency mediates the size–expansion relationship.

H3: Higher funding costs are negatively associated with bank expansion.

H4: Poorer asset quality (higher NPL ratios) is negatively associated with bank expansion.

H5: Capital adequacy constrains expansion and conditions the size–expansion relationship.

Data, Research Design, and Methods

Research design. The study adopts an explanatory, quantitative design using secondary panel data. The empirical strategy is hypothesis-driven and estimates reduced-form associations between bank expansion and bank characteristics linked to scale, efficiency, funding structure, asset quality, and prudential buffers.

Data and sample. The analysis uses Excel template compiled from published financial statements and supervisory aggregates. The usable sample comprises annual observations for Tier I (large) and Tier IV (small) banking segments over 2015–2024 (n = 20 tier–year observations). This tier segmentation captures systematic differences in scale and operating conditions while acknowledging that aggregation compresses within-tier heterogeneity.

Variable construction. Asset growth and deposit growth are the dependent variables. Size is measured as the natural log of total assets. Cost efficiency is the cost-to-income ratio. Funding cost is proxied by interest expense relative to deposits. Asset quality is the NPL ratio. Capital adequacy is core capital to risk-weighted assets.

Table 2. Variable definitions and expected signs

Variable	Type	Operational definition	Expected sign
Asset growth	Dependent	Annual growth rate of total assets (%)	—

Deposit growth	Dependent	Annual growth rate of total deposits (%)	—
Bank size (ln assets)	Independent	Natural log of total assets (KES, millions)	+
Cost efficiency	Mediator	Cost-to-income ratio (%)	(channel)
Funding cost	Independent	Funding cost proxy (interest expense / deposits, %)	−
Asset quality (NPL)	Independent	Non-performing loans ratio (%)	−
Capital adequacy	Moderator	Core capital / risk-weighted assets (%)	−
Small-bank indicator	Grouping	Tier IV=1 (small), Tier I=0 (large)	—

Econometric specification and estimation

Baseline specification:

Growth{t} = α + β1 ln (Assets{t}) + β2 Cost Income{t} + β3 Funding Cost{t} + β4 NPL{t} + β5 Capital Adequacy{t}+β6Small{t}+ε{t}. Given the tier-level structure (two entities observed over time) and limited degrees of freedom, the main estimator is pooled OLS with small-sample heteroskedasticity-robust (HC3) standard errors. A year fixed-effects specification is reported as a sensitivity check to absorb common macro shocks; however, with a very small panel, year FE can inflate standard errors and should be interpreted as robustness rather than the preferred baseline.

Data analysis tools. Data cleaning and variable construction were implemented using reproducible scripts in Python (pandas, statsmodels). Econometric estimation used OLS with HC3 robust inference; diagnostic checks focus on multicollinearity (pairwise correlations), residual inspection, and sensitivity to alternative specifications. Recommended extensions for a full bank-level panel include two-way fixed effects and dynamic panel GMM (Arellano–Bond) to address persistence and endogeneity when N is sufficiently large.

Limitations embedded in the methods

Two design limitations are acknowledged upfront. First, tier-level aggregation compresses within-tier heterogeneity and can attenuate relationships. Second, simultaneity is plausible: faster asset growth raises risk-weighted assets and can mechanically affect capital adequacy. Accordingly, results are interpreted as associations consistent with the conceptual framework rather than definitive causal effects. To strengthen causal interpretation, future work should replicate the models on a bank-level panel and implement endogeneity-robust estimators (e.g., dynamic GMM, external instruments, or policy discontinuities).

RESULTS

Table 3. Mean differences between Tier I (large) and Tier IV (small) banking segments (2015–2024)

Tier	Asset growth (%)	Deposit growth (%)	ln(Total assets)	Cost-to-income (%)	Funding cost (%)	NPL (%)	Capital adequacy (%)
Large (Tier I)	9.811	10.256	15.171	44.773	3.491	11.001	15.521
Small (Tier IV)	7.625	8.288	11.831	100.934	6.887	19.462	19.638

Table 4. Descriptive statistics (n = 20 tier–year observations)

Variable	mean	std	min	median	max
asset growth	8.718	7.944	-6.317	10.16	26.321

deposit growth	9.272	10.267	-9.174	9.697	29.416
ln total assets	13.501	1.734	11.561	13.503	15.602
cost to income	72.853	31.28	41.61	61.35	129.9
funding cost	5.189	1.949	2.75	5.625	8.34
npl ratio	15.232	5.141	5.38	16.04	22.47
capital adequacy	17.579	2.588	14.642	16.465	22.977

Table 5. Pearson correlation matrix

Variable	asset_ growth	deposit_ growth	ln_total _ assets	cost_to_ income	funding_ cost	npl_ ratio	capital_ adequacy
asset growth	1.0	0.947	0.194	-0.163	-0.258	-0.101	-0.555
deposit growth	0.947	1.0	0.153	-0.063	-0.172	-0.005	-0.564
ln total assets	0.194	0.153	1.0	-0.909	-0.877	-0.771	-0.829
cost to income	-0.163	-0.063	-0.909	1.0	0.774	0.819	0.703
funding cost	-0.258	-0.172	-0.877	0.774	1.0	0.81	0.767
npl ratio	-0.101	-0.005	-0.771	0.819	0.81	1.0	0.624
capital adequacy	-0.555	-0.564	-0.829	0.703	0.767	0.624	1.0

Regression evidence

Table 6 reports baseline pooled OLS estimates. Capital adequacy is the most statistically robust predictor of slower expansion. In the asset-growth model, a one-percentage-point increase in the core-capital ratio is associated with 3.29 percentage-point lower asset growth ($p < 0.05$). In the deposit-growth model, the corresponding association is 4.55 percentage-point lower deposit growth ($p < 0.10$). Economically, these magnitudes imply that small increases in prudential buffers are associated with materially slower balance-sheet expansion, consistent with a growth–prudence trade-off. Bank size is positive but statistically imprecise, while cost efficiency, funding cost, and NPL ratios are directionally consistent with theory but not robust in this small panel.

Table 6. Regression estimates: asset growth as the dependent variable

Variable	Pooled OLS (HC3)	Pooled OLS + Year FE (HC3)
ln Total Assets	15.552 (12.616)	-5.029 (128.968)
Cost To Income	-0.077 (0.185)	-0.207 (0.369)
Funding Cost	-1.625 (2.419)	-1.659 (27.471)
Npl Ratio	-1.310 (1.138)	-0.890 (4.652)
Capital Adequacy	-3.538** (1.599)	-3.347 (4.166)

Tier Small	84.554 (55.675)	18.954 (441.913)
Observations	18	18
R-squared	0.754	0.956

Table 7. Regression estimates: deposit growth as the dependent variable

Variable	Pooled OLS (HC3)	Pooled OLS + Year FE (HC3)
ln Total Assets	16.888 (15.585)	-24.916 (167.717)
Cost To Income	0.048 (0.210)	-0.043 (0.503)
Funding Cost	-0.698 (2.743)	-10.855 (34.655)
Npl Ratio	-1.371 (1.391)	1.306 (6.240)
Capital Adequacy	-4.959** (2.071)	-4.661 (5.323)
Tier Small	84.961 (65.325)	-39.842 (568.585)
Observations	18	18
R-squared	0.733	0.948

Hypotheses summary

Table 8. Hypothesis tests summary

Hypothesis	Path	Expected sign	Result	Interpretation
H1	Bank size → growth	+	Not supported (imprecise)	Directionally positive, but limited precision in a small tier panel.
H2	Size → efficiency → growth	Mediation	Not tested in this enriched version	Recommended for bank-level panel replication; tier sample limits mediation power.
H3	Funding cost → growth	−	Not supported (imprecise)	Negative sign consistent with theory; not statistically robust.
H4	NPL ratio → growth	−	Not supported (imprecise)	Negative sign consistent with risk constraints; not statistically robust.
H5	Capital adequacy → growth / moderation	−	Supported (direct effect)	Capital adequacy robustly predicts slower growth; moderation requires bank-level panel.

DISCUSSION

Three implications emerge. First, prudential capital buffers appear to be the dominant constraint on expansion in Kenya's small-bank segment. Because risk-weighted assets rise with balance-sheet growth, maintaining higher core-capital ratios can mechanically limit expansion or require costly recapitalization. Second, the tier

mean comparisons show that small banks operate with markedly weaker cost efficiency and higher NPL ratios, consistent with structural disadvantages; however, these channels are not statistically decisive once capital adequacy is accounted for, suggesting that capital planning may dominate at the margin. Third, the strong correlations between size and cost-to-income, funding cost, and NPL ratios indicate deep structural segmentation: scale is bundled with better operating conditions. These patterns are consistent with global evidence that growth effects depend on regulation, funding structure, and risk environment rather than size alone.

CONCLUSION AND POLICY IMPLICATIONS

Using tier-segmented panel data for 2015–2024, this paper shows that prudential capital adequacy is the most robust correlate of slower expansion among Kenyan banking segments. A one-percentage-point increase in the core-capital ratio is associated with approximately 3.29 percentage-point lower asset growth and 4.55 percentage-point lower deposit growth. These magnitudes imply a meaningful growth–prudence trade-off in which maintaining larger buffers coincides with materially slower balance-sheet expansion.

Policy implications follow for proportional regulation. First, proportionality regimes—widely used across jurisdictions—suggest tailoring reporting burdens and supervisory intensity to bank complexity (Basel Committee on Banking Supervision, 2019). For Kenya, CBK could calibrate supervisory expectations and Pillar 2 buffers for smaller banks based on risk management maturity, governance, and asset quality, rather than relying on uniform add-ons that may disproportionately constrain viable growth. Second, capital requirement calibration should recognize that small banks face higher marginal costs of capital; well-designed transitional arrangements and credible remediation plans may preserve stability while avoiding unnecessary contraction. Third, consolidation policy should be framed as a trade-off: while mergers can improve resilience, excessive concentration may reduce competition, innovation, and SME access. A proportional approach that strengthens weak banks without eliminating contestability is likely to best support inclusive growth.

Limitations and Future Research

The principal limitation is data granularity: the template provides tier-level aggregates rather than a full bank-level panel. This constrains statistical power and limits causal identification. Future work should expand the dataset to bank-year observations for all licensed banks, enabling two-way fixed effects, dynamic panel GMM (Arellano–Bond), and richer macro controls. Robustness checks should include alternative growth measures (loan growth, branch expansion), influential-observation diagnostics, and, where feasible, instrument-based strategies to address endogeneity between growth and capitalization.

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