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Capital Management Efficiency and Profitability Nexus: Evidence from a State-Owned and a Private Bank in Bangladesh

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ABSTRACT

This study examines the relationship between capital management efficiency and profitability in the banking sector of Bangladesh by comparing Rupali Bank PLC, a state-owned commercial bank, and Eastern Bank PLC, a private commercial bank, over 2020-2024. The study applies a quantitative comparative design using secondary data from published annual reports and regulatory sources. Capital management is evaluated through the Capital to Risk-Weighted Asset Ratio (CRAR), Tier 1 capital ratio, Tier 2 capital ratio, Liquidity Coverage Ratio (LCR), and Net Stable Funding Ratio (NSFR), while profitability is assessed through Return on Assets (ROA) and Return on Equity (ROE). Descriptive trend analysis, Pearson correlation, and ordinary least squares regression are used to examine the association between capital adequacy and financial performance. The findings show a clear divergence between the two banks. Eastern Bank PLC maintained CRAR above 14% throughout the period, improved ROA from 1.22% to 1.34%, and increased ROE from 15.04% to 18.63%. Rupali Bank PLC experienced a decline in CRAR from 8.00% to 2.95%, very low ROA, and volatile ROE. Regression results indicate a positive association between CRAR and both ROA and ROE within the limited bank-year sample. The study concludes that strong core capital, efficient risk-weighted asset management, and sustainable profitability are essential for resilient capital management under Basel III.

INTRODUCTION

Capital management is central to banking stability because banks operate with high leverage and transform short-term deposits into longer-term earning assets. A bank that maintains adequate and high-quality capital can absorb unexpected losses, support depositor confidence, and continue intermediation during stress. In Bangladesh, capital management has become more important following the adoption of Basel III-based capital and liquidity standards by Bangladesh Bank. These standards require banks to maintain minimum regulatory capital, strengthen Tier 1 capital, and manage short-term and long-term liquidity through LCR and NSFR. However, compliance alone does not ensure efficiency; banks must also convert capital-supported assets into sustainable earnings.

The public-private distinction is particularly relevant in the Bangladeshi banking sector. State-owned commercial banks often carry legacy asset-quality problems, governance constraints, and policy-driven lending exposures, while private commercial banks may face stronger market discipline and performance incentives. These institutional differences can shape capital adequacy, risk-weighted asset management, profitability, and liquidity planning. A comparison between Rupali Bank PLC and Eastern Bank PLC is therefore useful because the two institutions operate under the same national regulatory framework but differ substantially in ownership structure and managerial incentives.

This article adapts and develops the author's BIBM dissertation into a journal-oriented manuscript.

The purpose is to examine whether stronger capital management is associated with higher profitability in a state-owned and a private bank in Bangladesh. The specific objectives are to compare capital adequacy using CRAR, Tier 1, and Tier 2 capital ratios; evaluate profitability using ROA and ROE; assess liquidity strength using LCR and NSFR; and examine the relationship between CRAR and profitability through correlation and regression analysis. The contribution of the paper lies in integrating regulatory capital, profitability, and liquidity indicators into a concise comparative framework that highlights the capital management weaknesses of a state-owned bank and the relatively stronger efficiency of a private bank.

LITERATURE REVIEW

Capital adequacy, Basel III and bank profitability

The Basel III framework was introduced to strengthen the quality and quantity of bank capital, improve loss-absorption capacity, and reduce systemic vulnerability after the global financial crisis (Basel Committee on Banking Supervision, 2011). Under this framework, capital adequacy is not merely a compliance requirement; it is linked with risk management, market discipline, and the ability to maintain lending during adverse conditions. For banks operating in emerging economies, the adequacy of Tier 1 capital is especially important because internal capital generation is often constrained by asset-quality problems and limited access to external equity.

Capital theory provides mixed expectations regarding the capital-profitability relationship. Modigliani and Miller (1958) suggest that under perfect market assumptions,

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capital structure does not affect firm value. Banking markets, however, are characterized by regulation, deposit insurance, asymmetric information, bankruptcy costs, and systemic externalities. As a result, bank capital structure matters for both risk and profitability. Buffer capital theory further argues that banks hold capital above regulatory minima to avoid costly recapitalization and supervisory intervention (Berger et al., 1995). In this view, well-capitalized banks may enjoy lower distress risk and stronger stakeholder confidence, but excessive idle capital may reduce equity returns if it is not deployed efficiently.

Profitability is commonly assessed using ROA and ROE. ROA measures how efficiently a bank converts its total assets into earnings, whereas ROE measures the return generated for shareholders from equity capital. In capital management research, these indicators are important because retained earnings are a major source of core capital. Sustainable profitability therefore improves a bank's capacity to replenish Tier 1 capital internally, while weak profitability can accelerate capital erosion.

Ownership structure and public-private bank differences

Ownership structure influences bank performance through governance quality, lending incentives, operational discipline, and risk-control practices. Private banks are generally expected to respond more quickly to market discipline, adopt modern risk management systems, and optimize asset allocation. State-owned banks may perform important social and developmental functions, but they can also face weaker incentive structures, slower operational reforms, and higher exposure to non-performing assets. These differences may affect the relationship between capital adequacy and profitability.

Recent evidence on Bangladesh indicates that bank capital adequacy is influenced by profitability, leverage, size, and macroeconomic conditions (Naoaj, 2023). Other research on Basel III implementation in Bangladesh suggests that tighter liquidity and capital requirements can affect interest rate spreads, lending, and bank profitability (Hazra et al., 2023). These studies show that capital regulation has direct implications for both financial stability and bank-level performance. Nevertheless, focused comparative evidence between

a state-owned and a private bank remains useful for identifying practical weaknesses in capital utilization and internal capital generation.

The present study is guided by an integrated theoretical framework in which capital quality supports asset efficiency, asset efficiency improves profitability, profitability strengthens retained earnings, and retained earnings reinforce the core capital base. The relationship may be summarized as follows: Tier 1 capital and CRAR support risk absorption and lending capacity; efficient asset utilization raises ROA; stronger ROA contributes to ROE and retained earnings; and retained earnings strengthen future capital adequacy.

MATERIALS AND METHODS

The study uses a quantitative, descriptive, and comparative research design. It compares Rupali Bank PLC and Eastern Bank PLC over the five-year period from 2020 to 2024. The period is selected because it captures recent Basel III-based capital and liquidity reporting and allows a consistent comparison across annual reports. The data are secondary and are taken from published annual reports of the two banks and relevant regulatory publications. No primary interviews or confidential bank data are used.

Rupali Bank PLC is treated as the state-owned commercial bank case and Eastern Bank PLC as the private commercial bank case. The study does not claim that two banks represent the entire Bangladeshi banking sector; rather, it uses the two cases as a focused comparison of capital management outcomes under different ownership structures. This limitation is explicitly considered when interpreting regression results.

The main explanatory variable is CRAR, which measures total regulatory capital as a percentage of risk-weighted assets. Profitability is measured by ROA and ROE. Tier 1 and Tier 2 capital ratios are used to evaluate capital quality and supplementary support. LCR and NSFR are used to assess short-term liquidity resilience and long-term funding stability. The study applies trend analysis, ratio comparison, Pearson correlation, and ordinary least squares regression. The empirical models are: $ROA = \alpha + \beta(CRAR) + \epsilon$ and $ROE = \alpha + \beta(CRAR) + \epsilon$. Because the sample consists of only ten bank-year observations, the regression results are interpreted as exploratory evidence rather than sector-wide causal proof.

Table 1: Variables used in the study.

Variable	Meaning	Role in study
CRAR	Total regulatory capital divided by risk-weighted assets	Capital adequacy
Tier 1	Core capital ratio, including high-quality loss-absorbing capital	Capital quality
Tier 2	Supplementary capital ratio	Additional capital support
ROA	Net income divided by total assets	Asset profitability
ROE	Net income divided by shareholders' equity	Equity profitability
LCR	High-quality liquid assets divided by 30-day net cash outflows	Short-term liquidity
NSFR	Available stable funding divided by required stable funding	Long-term funding stability

RESULTS AND DISCUSSION

Capital adequacy and capital structure

The capital adequacy results show a substantial difference between the two banks. Eastern Bank PLC maintained a strong CRAR throughout the study period, with the ratio remaining above 14% in every year and standing at 15.11% in 2024. Its Tier 1 ratio increased from 10.78% in 2020 to 11.76% in 2024, showing that the bank relies on a comparatively strong core capital base. Tier 2 capital remained stable and acted as supplementary support rather than a substitute

for core capital.

Rupali Bank PLC shows a contrasting pattern. Its CRAR declined from 8.00% in 2020 to 2.95% in 2024. Tier 1 capital fell from 4.21% to 2.75%, while Tier 2 capital declined from 3.79% to only 0.20%. This pattern indicates erosion of both core and supplementary capital and suggests that the bank was unable to align risk-weighted asset growth with capital formation. The decline is particularly important because low capital adequacy restricts the capacity of a bank to absorb losses, expand lending, and maintain market confidence.

Table 2: Capital adequacy and capital structure indicators (%).

Year	EBL CRAR	RBL CRAR	EBL Tier 1	RBL Tier 1	EBL Tier 2	RBL Tier 2
2020	15.23	8.00	10.78	4.21	4.45	3.79
2021	14.08	5.56	10.31	3.57	3.76	1.99
2022	14.61	4.92	10.73	3.28	3.88	1.64
2023	15.07	5.28	10.91	3.35	4.16	1.94
2024	15.11	2.95	11.76	2.75	3.35	0.20

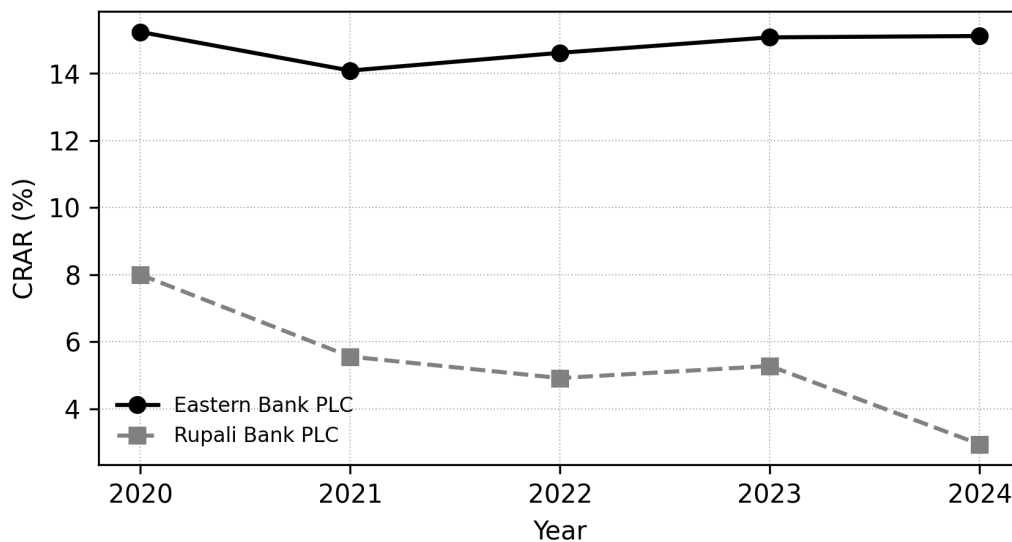


Figure 1: Capital to Risk-Weighted Asset Ratio (CRAR) trend, 2020-2024.

Profitability and capital efficiency

Profitability indicators reinforce the capital adequacy findings. Eastern Bank PLC achieved stable and improving profitability, with ROA rising from 1.22% in 2020 to 1.34% in 2024. Its ROE also increased from 15.04% to 18.63%. These results suggest efficient asset utilization and effective conversion of shareholders' equity into earnings. Strong profitability supports internal capital generation, which in turn helps preserve Tier 1

capital.

Rupali Bank PLC recorded very weak profitability. ROA remained between 0.01% and 0.07%, and ROE fluctuated from 0.92% in 2020 to 0.50% in 2024, with a temporary rise to 3.30% in 2023. Such low profitability limits the ability to build retained earnings and reinforces the capital adequacy problem. In a banking context, weak ROA implies poor productivity of assets, while weak ROE indicates ineffective use of equity capital.

Table 3: Profitability indicators (%).

Year	EBL ROA	RBL ROA	EBL ROE	RBL ROE
2020	1.22	0.03	15.04	0.92
2021	1.28	0.06	15.51	2.05
2022	1.21	0.03	15.46	1.26
2023	1.27	0.07	16.85	3.30
2024	1.34	0.01	18.63	0.50

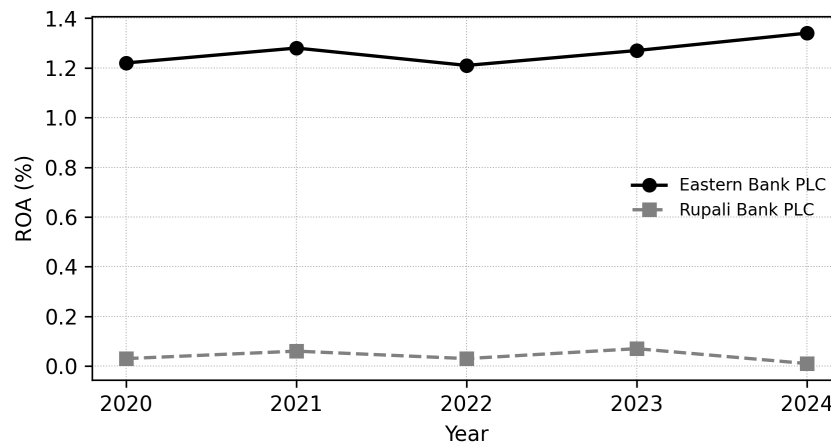


Figure 2: Return on Assets (ROA) trend, 2020-2024.

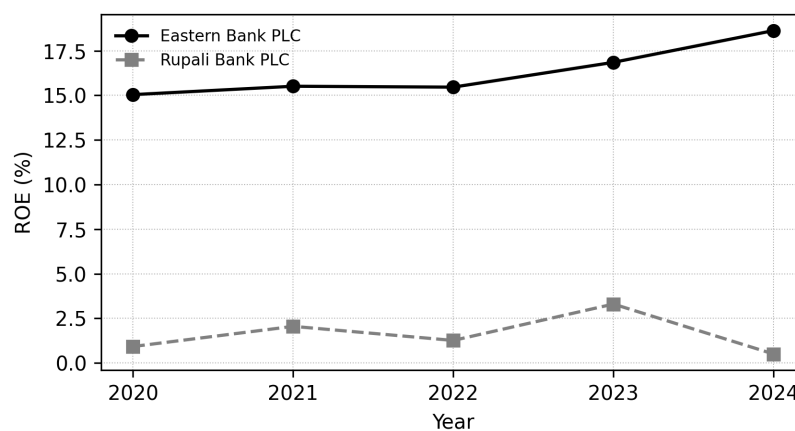


Figure 3: Return on Equity (ROE) trend, 2020-2024.

Liquidity and long-term funding stability

Both banks maintained LCR above the regulatory threshold of 100%, but the nature of liquidity management differed. Eastern Bank PLC maintained a comparatively balanced LCR, ranging from 104.36% to 210.90% and rising to 190.17% in 2024. Rupali Bank PLC reported very high and volatile LCR values, including 509.44% in 2021 and 264.27% in 2024. Although a high LCR indicates capacity to meet short-term obligations, excessive and volatile

liquidity can also signal underutilization of liquid assets and limited conversion of funds into profitable earning assets. The NSFR results show stronger long-term funding stability for Eastern Bank PLC. Its NSFR increased from 105.49% in 2020 to 119.00% in 2024. Rupali Bank PLC, however, remained volatile, falling to 93.23% in 2022 and standing at 99.28% in 2024. This indicates a weaker stable funding position and suggests a need for stronger long-term funding strategy.

Table 4: Liquidity and funding indicators (%).

Year	EBL LCR	RBL LCR	EBL NSFR	RBL NSFR
2020	210.90	393.54	105.49	104.15
2021	144.97	509.44	104.40	98.75
2022	104.36	271.88	105.53	93.23
2023	104.64	408.68	107.61	99.22
2024	190.17	264.27	119.00	99.28

Correlation and regression evidence

Pearson correlation results indicate that CRAR is strongly and positively associated with ROA and ROE in the pooled bank-year sample. CRAR has a correlation of 0.971 with ROA and 0.964 with ROE. Tier 1 capital is even more strongly correlated with profitability, suggesting that the quality of core capital is particularly

important for efficient profitability generation. LCR is negatively correlated with profitability in this sample, reflecting the fact that Rupali Bank maintained very high liquid assets while generating weak earnings. This does not imply that liquidity is harmful; rather, it indicates that liquidity must be deployed efficiently. The regression results also show a positive association

between CRAR and profitability. In the ROA model, the coefficient of CRAR is 0.122, meaning that a one percentage point increase in CRAR is associated with an estimated 0.122 percentage point increase in ROA in this sample. In the ROE model, the coefficient of

CRAR is 1.468. Both models have high explanatory power, but the findings should be interpreted cautiously because the small sample and two-bank structure mean that results are influenced by between-bank differences.

Table 5: Pearson correlation matrix.

Variable	CRAR	ROA	ROE	LCR	NSFR
CRAR	1.000	0.971	0.964	-0.744	0.766
Tier 1	0.987	0.994	0.990	-0.796	0.785
Tier 2	0.888	0.758	0.744	-0.483	0.595
ROA	0.971	1.000	0.994	-0.821	0.747
ROE	0.964	0.994	1.000	-0.794	0.779
LCR	-0.744	-0.821	-0.794	1.000	-0.479
NSFR	0.766	0.747	0.779	-0.479	1.000

Table 6: Exploratory OLS regression results.

Model	Variable	Coefficient	t-value	p-value	R-squared
ROA model	Constant	-0.576	-4.812	0.0013	0.942
ROA model	CRAR	0.122	11.396	0.0000	
ROE model	Constant	-5.848	-3.646	0.0065	0.929
ROE model	CRAR	1.468	10.252	0.0000	

Policy implications

The findings have direct policy relevance for bank management and regulators. First, capital adequacy should be evaluated not only by the level of CRAR but also by the quality and sustainability of Tier 1 capital. For Rupali Bank PLC, strengthening core capital through retained earnings, recapitalization planning, and stricter risk-weighted asset control should be a priority. Second, weak profitability must be treated as a capital management problem because low ROA and ROE reduce internal capital generation. Improving asset quality, cost efficiency, and credit risk screening is therefore essential.

Third, Bangladesh Bank may strengthen supervisory attention on banks that maintain high liquidity but weak profitability and low capital adequacy. Liquidity buffers are necessary, but they should not mask inefficient deployment of funds. Fourth, state-owned banks require governance reforms that connect risk-taking, lending quality, and capital planning. Internal Capital Adequacy Assessment Process practices should be linked more closely with business strategy, asset quality review, and stress testing.

CONCLUSION

This study concludes that capital management efficiency is closely associated with profitability and financial resilience in the examined Bangladeshi banks. Eastern Bank PLC demonstrates effective capital management through strong CRAR, a robust Tier 1 capital base, stable liquidity, improving NSFR, and consistently higher ROA and ROE. Rupali Bank PLC shows serious weaknesses, including declining CRAR, erosion of Tier 1 and Tier 2 capital, very low profitability, and volatile

liquidity and funding indicators. The evidence suggests that high liquidity alone does not ensure sound capital management; capital strength must be supported by efficient asset utilization, disciplined risk-weighted asset management, and sustainable profitability. The study recommends that state-owned banks strengthen core capital, improve asset quality, enhance governance, and align liquidity management with profitable deployment of funds. The main limitation of the study is the small two-bank sample over a five-year period, which restricts sector-wide generalization. Future research should extend the sample to more public, private, and Islamic banks over a longer period and apply panel data methods to test the robustness of the capital-profitability relationship.

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