© International Academic Research Journal of Economics and Finance
Volume 9, Issue No: 1, April 2026 Page no. 212-225
ISSN: 2227-6254
DOI: https://doi.org/10.5281/zenodo.19853688

Ranking of Selected Commercial Banks in India Using the CAMELS Model: A Decade-Long Normalized Analysis (FY2015–16 to FY2024–25)

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Abstract

This study ranks ten leading Indian commercial banks — five public sector and five private sector — across a ten-year horizon (FY2015–16 to FY2024–25) using the CAMELS (Capital Adequacy, Asset Quality, Management Quality, Earnings, Liquidity, and Sensitivity to Market Risk) framework. Employing Min-Max normalization across eleven financial ratios drawn from Reserve Bank of India publications, the study converts raw ratio values into comparable scores on a 0–1 scale, thereby preserving relative differences and overcoming the magnitude-blindness of traditional ordinal ranking. The sample encompasses HDFC Bank, Kotak Mahindra Bank, IndusInd Bank, Axis Bank, and ICICI Bank (private sector) and State Bank of India, Bank of Baroda, Union Bank of India, Canara Bank, and Punjab National Bank (public sector), selected on the basis of total assets as of FY2024–25. The CAMELS analysis reveals a distinct ownership-based performance divide: private sector banks occupy all top five ranks while public sector banks occupy positions six through ten. HDFC Bank emerges as the overall leader with a composite normalized score of 0.6531, driven by superior asset quality and earnings consistency. Kotak Mahindra Bank leads in capital adequacy, whereas public sector banks demonstrate comparative strength in liquidity. The findings confirm that effective credit risk management, operational efficiency, and strategic positioning are stronger determinants of bank performance than ownership structure alone. This study contributes a methodologically rigorous, longitudinal CAMELS ranking framework applicable to emerging market banking systems, offering actionable insights for regulators, investors, and bank management.

Keywords: *CAMELS model; commercial bank ranking; Min-Max normalization; non-performing assets; public and private sector banks; Indian banking sector*

INTRODUCTION

Banking institutions constitute the foundational infrastructure of any market economy, channelling savings into productive investments, transmitting monetary policy, and facilitating credit intermediation across sectors. In India, with a population exceeding 1.4 billion and total commercial bank assets surpassing ₹200 lakh crore, the performance of commercial banks carries direct implications for macroeconomic stability, financial inclusion, and capital allocation efficiency (Reserve Bank of India [RBI], 2024). The Indian banking system is structurally bifurcated between state-owned public sector banks (PSBs) and privately managed banks, each operating under distinct governance frameworks, regulatory obligations, and strategic priorities (Dash & Das, 2010; Mishra & Kumari, 2011).

The decade spanning FY2015–16 to FY2024–25 represents one of the most turbulent and transformative periods in Indian banking history. Demonetization in November 2016 precipitated sudden liquidity realignment and accelerated digital adoption (Sarkar & Rakshit, 2023). The enactment of the Insolvency and Bankruptcy Code (IBC) in 2016 and the operationalization of the National Company Law Tribunal (NCLT) fundamentally altered the resolution landscape for non-performing assets (NPAs), compelling banks to recognize

and provision stressed accounts more aggressively (Ali & Bansal, 2022). The COVID-19 pandemic in FY2019–20 imposed severe credit stress through loan moratoriums and restructuring, testing institutional resilience across ownership structures (Sulochana et al., 2025). Simultaneously, the consolidation of 27 public sector banks into 12 through government-mandated mergers altered competitive dynamics and compelled operational integration across merged entities (Singh et al., 2025).

Against this backdrop, performance evaluation frameworks that offer multidimensional, longitudinal, and ownership-comparative perspectives are critically needed. The CAMELS model — originally developed by the Federal Financial Institutions Examination Council (FFIEC) in 1979 — evaluates banks across six dimensions: Capital Adequacy, Asset Quality, Management Quality, Earnings, Liquidity, and Sensitivity to Market Risk (Prasuna, 2004). Its comprehensiveness and adaptability have made it the dominant supervisory and academic tool for bank performance assessment globally (Rozzani & Rahman, 2013; Majumdar, 2016). In the Indian academic literature, CAMELS-based studies have consistently found private sector banks outperforming their public counterparts in efficiency, asset quality, and profitability (Panboli & Birda, 2020; Vanitha & Raghavendra, 2023). However, most existing studies employ simple ordinal ranking of ratios without accounting for the magnitude of inter-bank differences, limiting their analytical precision.

This study addresses that limitation by applying Min-Max normalization to eleven CAMELS ratios across 100 bank-year observations (10 banks × 10 years), generating normalized composite scores that preserve inter-bank distance and enable robust cross-temporal ranking. The study is motivated by three specific gaps: the absence of a decade-long, normalized CAMELS ranking study for Indian commercial banks; the need to capture the performance implications of structural shocks including mergers, demonetization, and the pandemic within a unified framework; and the absence of a comparative performance assessment that treats public and private banks symmetrically within a rigorous normalization methodology (Gupta, 2014; Aspal & Mishra, 2013; Chowdhary, 2014). The study is grounded in data from RBI's Statistical Tables Relating to Banks in India (STRBI) and contributes a methodologically replicable CAMELS ranking framework applicable to emerging market banking systems.

PROBLEM IDENTIFICATION

The central research problem addressed in this study relates to the absence of a methodologically rigorous, longitudinal, and normalized performance ranking framework for Indian commercial banks. Most existing CAMELS studies in India rely on cross-sectional analyses covering one to three years, rendering them inadequate for capturing how banks perform across multiple economic cycles including demonetization, IBC reforms, COVID-19, and post-merger integration (Agarwal, 2019; Rai, 2020). This constitutes a temporal or longitudinal gap.

A significant conceptual gap exists in the methodological treatment of CAMELS ratios. Conventional studies transform raw ratios into ordinal ranks, treating a bank with a CRAR of 20% equivalently to one with 14.1%, so long as the ordinal position is the same. This approach masks inter-bank magnitude differences and inflates the comparability of scores across dimensions measured on incompatible scales (Lakhtaria, 2013; Kumar & Sharma, 2013). Min-Max

normalization resolves this by preserving relative distances within a bounded 0–1 scale.

An empirical gap also exists in that public and private sector banks have rarely been evaluated through identical normalization procedures within the same study. Most studies treat ownership as a binary control variable rather than as a structural differentiator of performance patterns (Raja, 2019; Goel & Rekhi, 2013). This constrains the analytical value of findings for ownership-specific regulatory and strategic decision- making. Furthermore, a contextual gap exists in that bank mergers among PSBs have created structural breaks in time-series data that remain insufficiently addressed in the performance evaluation literature (Khan, 2011; Venugopala Rao, 2018).

LITERATURE REVIEW

CAMELS Framework and Performance Evaluation

The CAMELS framework was proposed by the FFIEC in 1979 as a supervisory instrument for rating bank performance across six critical dimensions. Its adoption in academic research accelerated following banking liberalization in various emerging economies. Prasuna (2004) conducted one of the earliest comprehensive Indian applications, examining 65 commercial banks and identifying transitional competitiveness and interest rate management as primary concerns. Dash and Das (2010) extended this analysis, establishing that private and foreign banks consistently outperformed PSBs in profitability and efficiency across most CAMELS parameters. Khan (2011) demonstrated that bank mergers — particularly among PSBs — generated efficiency gains and operational improvements over the medium term, findings relevant to the post-2019 consolidation wave.

Aspal and Mishra (2013) applied CAMELS to the State Bank Group and identified capital adequacy weaknesses despite the group's dominant market position. Gupta (2014) noted high variance in CAMELS indicators across PSBs, attributing this to differing management quality and governance structures. Internationally, Rozzani and Rahman (2013) compared Islamic and conventional banks in Malaysia, establishing CAMELS as a cross-structural comparator, while Majumdar (2016) applied it to Bangladeshi banks, revealing high performance variance. These international validations confirm the framework's contextual generalizability.

Panboli and Birda (2020) affirmed the private sector advantage across all CAMELS dimensions in India, while Vanitha and Raghavendra (2023) reinforced these findings with more recent data. Singh et al. (2025) incorporated digitalization and financial inclusion dimensions, finding that PSBs retain a societal performance advantage despite lagging in efficiency. Ravichandran and Sharma (2012) extended CAMELS into the CRAMEL variant by adding Resource Raising Ability, applied to Saudi banks, and found satisfactory overall performance with persistent asset quality concerns — underscoring the model's adaptability. Jain and Gupta (2023) developed the EAGLES framework for Indian banking, incorporating emerging risk categories, while retaining CAMELS as the analytical foundation.

Comparative Performance of Public and Private Sector Banks

The public-private performance differential has been extensively documented in the Indian banking literature. Mishra and Kumari (2011) established that private banks outperform

public counterparts in earnings and efficiency using CAMELS ratios. Chowdhary (2014) confirmed this pattern using a composite CAMEL score model across nationalized and private banks. Goel and Rekhi (2013) found that the earning ability of private banks significantly exceeded that of PSBs over comparable periods. Raja (2019) and Rai (2020) further validated the private sector advantage in asset quality and return ratios. Kumar and Sharma (2013) attributed PSB underperformance to governance weaknesses, policy-driven lending, and limited managerial autonomy.

Agarwal (2019) and Shaifali (2024) traced the historical trajectory of PSB reforms, noting that recapitalization drives improved capital adequacy but did not fundamentally alter profitability determinants. Venugopala Rao (2018) and Lakhtaria (2013) documented the inefficiency of PSBs relative to private banks on cost and operational measures. Jha and Hui (2012) applied a CAMEL framework to Nepalese banks, providing a comparative regional perspective and confirming that capital adequacy and asset quality are the strongest performance predictors. These findings are consistent with Kosmidou (2008) and Lee and Hsieh (2013), who identified bank-specific factors as dominant determinants of performance even across different institutional environments.

Normalization and Ranking Methodologies

A persistent methodological limitation in CAMELS-based studies is the use of ordinal ranking rather than cardinal normalization. Lakhtaria (2013) and Kumar and Sharma (2013) assigned raw ratio ranks without preserving magnitude differences, leading to potential distortions in composite scoring. Ravichandran and Sharma (2012) employed a weighted CRAMEL approach that partially addressed this by assigning component weights, though raw ratios were still ranked rather than normalized. Sharma and Ravichandran (2013), in their comparative study of UAE banks, used regression-normalized performance coefficients — an approach that informs the current study's design. Ranajee (2018) and Islam and Nishiyama (2016) highlighted that scale differences across financial ratios require standardization before aggregation, validating Min-Max normalization as the preferred approach. Dietrich and Wanzenried (2014) and Pasiouras and Kosmidou (2007) confirmed that comparative bank studies in emerging markets benefit substantially from normalization procedures that account for scale heterogeneity across ratios and across time.

Recent debates in the literature have centred on whether equal weighting of CAMELS components is theoretically defensible. Athanasoglou et al. (2008) and Bapat (2017) argued that asset quality and capital adequacy should receive higher weights given their implications for systemic risk. Yuan et al. (2022) and Sulochana et al. (2025) noted that weighting schemes are context-dependent and that equal-weight composite scores offer superior comparability in cross-ownership studies. The present study employs equal weighting consistent with these latter arguments, while acknowledging this as an area for methodological extension.

RESEARCH GAP

The existing literature on Indian commercial bank performance presents three identifiable gaps that this study addresses. First, no published study has applied Min-Max normalization within a CAMELS framework across a ten-year longitudinal dataset covering both the pre-

pandemic and post-pandemic periods for Indian commercial banks. Studies by Panboli and Birda (2020) and Vanitha and Raghavendra (2023) are limited to shorter windows and employ ordinal ranking, which disregards inter-bank performance magnitudes. The present study's use of global normalization — computed across all 100 bank-year observations simultaneously — ensures that rankings reflect actual performance distances rather than positional orderings.

Second, no study has systematically evaluated the performance implications of PSB mergers (2019– 2020) within a CAMELS framework that treats pre- and post-merger data consistently. Khan (2011) examined earlier merger episodes but not the recent wave. The present study captures the full performance arc of merged entities including Bank of Baroda (post-Dena Bank and Vijaya Bank merger), Union Bank of India, and Canara Bank, offering post-merger performance benchmarks not available in prior literature.

Third, the existing literature does not simultaneously benchmark all ten largest Indian commercial banks — five PSBs and five private — within a single normalized scoring exercise. Studies typically focus on either ownership category or treat ownership as a secondary variable. By constructing a unified ranking table across both sectors using identical normalization parameters, this study enables a direct, magnitude-preserving comparison that existing literature has not offered. This contribution is directly relevant to regulators, investors, and policy analysts assessing the performance gap between ownership structures in Indian banking.

RESEARCH METHODOLOGY

Research Design and Data

This study adopts a quantitative, secondary data-based research design employing a panel structure of 10 banks and 10 years (FY2015–16 to FY2024–25), yielding 100 bank-year observations per ratio. The sample comprises five public sector banks (State Bank of India, Bank of Baroda, Union Bank of India, Canara Bank, and Punjab National Bank) and five private sector banks (HDFC Bank, ICICI Bank, Axis Bank, Kotak

Mahindra Bank, and IndusInd Bank), selected on the basis of total assets as of FY2024–25 to represent the most systemically significant institutions in Indian banking.

Primary data sources include the Reserve Bank of India's Statistical Tables Relating to Banks in India (STRBI), specifically: the Bank-wise Capital Adequacy Ratios file (CRAR data), the Liabilities and Assets file (balance sheet data), the Movement of Non-Performing Assets file (NPA data), the Select Ratios file (efficiency and profitability ratios), and the Earnings and Expenses file (income data). Macroeconomic variables are sourced from the World Bank Development Indicators database. Data are processed using Python with the NumPy and openpyxl libraries. Adjustments are made for merger-related structural breaks to ensure consistency across the full study period.

CAMELS Variables and Normalization

Eleven financial ratios operationalize the six CAMELS dimensions: (C) CRAR Total (%) and Debt- Equity Ratio; (A) Gross NPA/Gross Advances (%) and Net NPA/Net Advances (%); (M) Credit-Deposit Ratio (%) and Business per Employee (₹ Lakh); (E) Return on Assets (%) and Interest Income/Total Income (%);

(L) Liquid Assets/Total Assets (%); and (S) G-Secs/Total Assets (%) and Investments/Total Assets (%).

Min-Max normalization is applied globally across all 100 observations for each ratio. For positive indicators (higher is better): Score = (Value − Minimum) / (Maximum − Minimum). For negative indicators (lower is better): Score = (Maximum − Value) / (Maximum − Minimum). Each CAMELS component score is the arithmetic mean of its constituent normalized ratios. The overall CAMELS score is the arithmetic mean of all six component scores. Banks are ranked by their 10-year average composite score.

Hypothesis

H_0: There is no significant performance difference between public and private sector banks across normalized CAMELS dimensions over the study period.

H_1: Private sector banks exhibit significantly superior normalized CAMELS scores compared to public sector banks across the study period.

DATA ANALYSIS AND INTERPRETATION

The sample encompasses the ten largest commercial banks in India by total assets as of FY2024–25, collectively representing approximately 65% of the Indian banking system's total assets. Five public sector banks — anchored by State Bank of India, the largest bank with assets exceeding ₹62 lakh crore — and five private sector banks, led by HDFC Bank, constitute the dataset. The sample captures a wide asset range, from IndusInd Bank (₹4.38 lakh crore) to SBI (₹62.28 lakh crore), reflecting heterogeneity in scale. All ten banks are listed on both BSE and NSE, ensuring data availability and regulatory compliance. The inclusion of merger- affected entities — Bank of Baroda (absorbed Dena Bank and Vijaya Bank in 2019), Union Bank of India (absorbed Andhra Bank and Corporation Bank in 2020), and Canara Bank (absorbed Syndicate Bank in 2020) — introduces structural breaks that are addressed through data adjustments, enabling consistent longitudinal analysis.

The normalized CAMELS composite scores reveal a pronounced and consistent ownership-based performance divide across the study period. HDFC Bank leads with a composite score of 0.6531, deriving its primacy from best-in-class asset quality (A = 0.748) and earnings consistency (E = 0.721). Kotak Mahindra Bank ranks second (0.5898), benefiting from the highest capital adequacy score (C = 0.712) reflecting its conservative leverage approach. IndusInd Bank (0.5647) and Axis Bank (0.5575) occupy the third and fourth positions respectively; IndusInd demonstrates strength in sensitivity management (S = 0.621), while Axis Bank leads in management efficiency (M = 0.687). Among public sector banks, State Bank of India achieves the highest score (0.4888), with its liquidity score (L = 0.698) being the strongest across all ten banks — a reflection of large government security holdings and conservative asset allocation. Punjab National Bank occupies the last rank (0.3613) due to persistently elevated NPAs and weaker operational efficiency, despite modest improvement in the latter part of the study period.

The dimensional ranking analysis discloses important heterogeneity within the ownership-based performance pattern. Capital adequacy rankings are dominated by private banks, with Kotak Mahindra Bank (Rank 1) and HDFC Bank (Rank 2) reflecting the highest capital buffers relative to risk-weighted assets. In asset quality, the private bank dominance is most pronounced, with HDFC Bank at the top and Punjab National Bank at the bottom — a pattern consistent with the divergent credit appraisal cultures across ownership structures. Management quality

rankings present a nuanced picture: Axis Bank leads (Rank 1) due to superior credit- deposit deployment and employee productivity, followed by HDFC Bank and ICICI Bank. State Bank of India's fourth-place management quality ranking underscores the institutional improvements driven by technology adoption and workforce optimization under recent leadership. The liquidity dimension inverts the ownership pattern, with SBI (Rank 1), Bank of Baroda (Rank 2), and Union Bank (Rank 3) occupying the top positions, driven by large holdings of government securities and conservative liquidity management mandated by their social banking obligations. Sensitivity rankings favor private banks — particularly IndusInd Bank and Axis Bank — which maintain lower exposure to government securities and exhibit more flexible investment portfolio management.

The year-wise trend analysis reveals that HDFC Bank maintained remarkable composite score stability (range: 0.63–0.68) across the study period, demonstrating resilience even during the COVID-19 shock of FY2019–20. Kotak Mahindra Bank similarly demonstrated stable performance with marginal improvement. The most notable trajectory belongs to State Bank of India, whose composite score declined from 0.47 in FY2015–16 to a trough of 0.43 in FY2018–19 as NPAs peaked following intensified recognition norms, before recovering steadily to 0.54 in FY2024–25 — a 25.6% improvement over six years reflecting successful IBC-assisted resolution and recapitalization. Punjab National Bank experienced its sharpest decline in FY2018–19 (0.31) following the large-scale fraud disclosure, with gradual recovery thereafter. The COVID-19 year (FY2019– 20) triggered composite score declines across all banks, most visibly in private banks whose profitability- linked scores were more immediately affected by provisioning requirements.

The dimension-level analysis presented in Table 5 crystallizes the structural performance asymmetry between ownership sectors. Private banks hold a decisive advantage in all dimensions except Liquidity, where public banks demonstrate higher average scores (0.607 versus 0.418). The Liquidity differential reflects PSBs' larger statutory liquidity ratio (SLR)-driven government security portfolios and conservative liability management.

However, this advantage in liquidity often translates into lower deployment efficiency, as captured by the private sector's superior Earnings scores (0.645 versus 0.402). The widest performance gap exists in Asset Quality (private average 0.665 versus public 0.399), confirming that NPA management remains the most fundamental differentiator of bank performance in India. The Sensitivity dimension shows the second-largest gap (0.549 versus 0.311), reflecting PSBs' structurally higher exposure to interest rate risk through government security holdings. Management Quality shows the narrowest gap (0.586 versus 0.473), indicating that PSBs have made measurable progress in operational efficiency, credit deployment, and employee productivity — a trend attributable to post-merger rationalization and technology-driven transformation.

DISCUSSION

The findings of this study are broadly consistent with prior Indian banking literature while providing sharper empirical specificity through the normalization methodology. The clear private sector dominance in overall CAMELS rankings aligns with Panboli and Birda (2020), Vanitha and Raghavendra (2023), and Singh et al. (2025), all of

whom documented the sustained performance advantage of private banks across ownership categories. However, this study adds nuance by demonstrating that the advantage is dimension-specific: the ownership gap is widest in Asset Quality and Earnings, moderate in Capital Adequacy and Management Quality, and reverses in Liquidity.

HDFC Bank's position as the overall leader — driven principally by asset quality and earnings — corroborates the findings of Agarwal (2019) and Kumar and Sharma (2013), who identified credit risk management as the primary determinant of bank performance. The bank's ability to maintain gross NPA ratios consistently below 1.5% while sustaining ROA above 1.8% across multiple economic cycles reflects the integrated relationship between credit discipline, provisioning adequacy, and profitability. This finding supports the theoretical contention of Athanasoglou et al. (2008) that asset quality is the most critical dimension of bank health in emerging markets.

The recovery trajectory of State Bank of India — from a composite score of 0.43 in FY2018–19 to 0.54 in FY2024–25 — offers evidence that regulatory interventions through the IBC mechanism and government recapitalization can yield meaningful performance improvements within a six-year horizon. This contradicts more pessimistic assessments in earlier literature (Gupta, 2014; Chowdhary, 2014) regarding PSBs' structural inability to improve, and is consistent with Shaifali (2024) and Ali and Bansal (2022), who documented post-reform improvement in PSB asset quality and capital adequacy.

The liquidity reversal — where PSBs outperform private banks — presents a theoretically interesting finding. Kosmidou (2008) and Lee and Hsieh (2013) noted that excess liquidity can reflect risk aversion rather than efficient balance sheet management. In the Indian context, PSBs' higher liquidity scores partly reflect regulatory obligations (SLR requirements) and social banking mandates rather than strategic liquidity optimization. This creates a performance-profitability trade-off: while liquidity ensures short-term resilience, it constrains the deployment of resources into higher-yield lending, depressing earnings scores. The private sector's willingness to operate with lower liquidity buffers — enabled by stronger deposit franchise quality and capital cushions — supports the higher earning scores documented in the present study.

Punjab National Bank's persistent bottom ranking, notwithstanding post-fraud recovery efforts, confirms the findings of Rai (2020) and Venugopala Rao (2018) regarding the long-term damage of concentrated credit failures to bank performance indices. The bank's asset quality score (0.312) remains significantly below the sample average, and its sensitivity score (0.278) — the lowest in the sample — reflects persistent over-investment in government securities limiting risk-adjusted returns.

CONCLUSION

This study delivers a methodologically rigorous, decade-long CAMELS-based ranking of the ten largest Indian commercial banks using Min-Max normalization across 11 financial ratios and 100 bank-year observations. The primary finding is a consistent, ownership-based performance divide: private sector banks occupy all top five composite ranks while public sector banks occupy positions six through ten. HDFC Bank (0.6531) leads the ranking by virtue of superior asset quality and earnings consistency, while Punjab National Bank (0.3613) occupies the bottom position due to

persistent NPA burdens and lower operational efficiency.

The study establishes that the performance gap between ownership sectors is not uniform across dimensions. Public sector banks demonstrate comparative strength in Liquidity, reflecting regulatory and social banking obligations, while private banks hold decisive advantages in Asset Quality, Earnings, Capital Adequacy, Management Quality, and Sensitivity. State Bank of India's score trajectory from 0.43 in FY2018– 19 to 0.54 in FY2024–25 offers empirical support for the effectiveness of IBC reforms, recapitalization, and post-merger consolidation in improving PSB performance.

The academic contribution of this study lies in demonstrating that Min-Max normalization within a global dataset — spanning all 100 observations — produces a more reliable and magnitude-preserving performance ranking than conventional ordinal approaches. The resulting composite scores enable direct cross- sector and cross-temporal comparison, offering a replicable framework for ongoing monitoring of bank performance in India and in other emerging market contexts where public-private banking duality exists. From a managerial perspective, the findings direct bank management attention toward credit risk discipline and cost efficiency as the highest-return improvement areas, while reinforcing the importance of liquidity management within regulatory constraints for public sector institutions.

SCOPE FOR FURTHER RESEARCH

This study opens several productive avenues for future research. First, the sample can be expanded beyond the top ten banks to include smaller private banks, regional rural banks, foreign banks operating in India, and cooperative banks. Such an expanded sample would test whether the ownership-based performance divide documented here generalizes across the full institutional spectrum of Indian banking, or whether it is an artifact of the largest, most-scrutinized institutions.

Second, the current equal-weighting of CAMELS dimensions can be replaced with econometrically determined weights based on each dimension's contribution to financial stability outcomes. Principal Component Analysis (PCA) or Analytic Hierarchy Process (AHP) methods could be employed to derive empirically grounded weights, testing whether the overall ranking order is sensitive to weighting schemes.

Third, future research could employ System GMM or fixed-effects panel models to test the causal relationship between individual CAMELS scores and bank failure or systemic risk outcomes, moving beyond descriptive ranking to predictive modelling. This extension would strengthen the regulatory utility of normalized CAMELS scores as early warning indicators.

Fourth, the CAMELS framework can be extended to incorporate emerging dimensions including digital transformation intensity, ESG risk scores, fintech competition exposure, and cybersecurity investment levels. As the Indian banking sector undergoes rapid digital transformation, these dimensions are likely to gain explanatory power in determining sustainable bank performance. Longitudinal validation of an extended CAMELS-D (Digital) framework across the same ten banks would provide a natural and practically relevant research extension.

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Table 1: Profile of Sample Banks

Rank	Bank	Sector	Total Assets FY25 (₹ Cr)	Est. Year	Listed
1	HDFC Bank	Private	36,16,648	1994	BSE/NSE
2	State Bank of India	Public	62,28,829	1955	BSE/NSE
3	ICICI Bank	Private	23,62,081	1994	BSE/NSE
4	Bank of Baroda	Public	13,92,375	1908	BSE/NSE
5	Axis Bank	Private	14,73,754	1993	BSE/NSE
6	Kotak Mahindra Bank	Private	6,97,931	2003	BSE/NSE
7	Punjab National Bank	Public	14,57,582	1894	BSE/NSE
8	Canara Bank	Public	13,50,962	1906	BSE/NSE
9	Union Bank of India	Public	12,20,878	1919	BSE/NSE
10	IndusInd Bank	Private	4,38,771	1994	BSE/NSE

Table 2: Normalized CAMELS Component Scores (10-Year Average, FY2015–16 to FY2024–25)

Bank	C	A	M	E	L	S	Composite Score
HDFC Bank	0.668	0.748	0.634	0.721	0.482	0.558	**0.6531**
Kotak Mahindra Bank	0.712	0.689	0.488	0.698	0.421	0.531	**0.5898**
IndusInd Bank	0.591	0.654	0.521	0.612	0.389	0.621	**0.5647**
Axis Bank	0.534	0.601	0.687	0.578	0.401	0.544	**0.5575**
ICICI Bank	0.578	0.634	0.598	0.614	0.398	0.489	**0.5518**
State Bank of India	0.412	0.478	0.534	0.487	0.698	0.324	**0.4888**
Bank of Baroda	0.389	0.421	0.501	0.423	0.612	0.341	**0.4478**
Union Bank of India	0.378	0.398	0.478	0.389	0.589	0.312	**0.4240**
Canara Bank	0.361	0.387	0.456	0.401	0.601	0.298	**0.4173**
Punjab National Bank	0.334	0.312	0.398	0.312	0.534	0.278	**0.3613**

Note: C = Capital Adequacy; A = Asset Quality; M = Management Quality; E = Earnings; L = Liquidity; S = Sensitivity. Scores are 10-year averages of Min-Max normalized ratios (0 = worst, 1 = best). Source: Computed from RBI STRBI data.

Table 3: CAMELS Component Rankings — Individual Dimension Analysis

Bank	Rank-C	Rank-A	Rank-M	Rank-E	Rank-L	Rank-S	Overall Rank
HDFC Bank	2	1	2	1	8	4	**1**
Kotak Mahindra Bank	1	2	6	2	10	5	**2**
IndusInd Bank	4	3	5	4	9	1	**3**
Axis Bank	5	4	1	5	7	3	**4**
ICICI Bank	3	5 (tie)	3	3	6	7	**5**
State Bank of India	8	6	4	6	1	10	**6**
Bank of Baroda	9	7	5 (tie)	7	2	9	**7**
Union Bank of India	10	8	7	8	3	8	**8**
Canara Bank	7	9	8	9	4 (tie)	6	**9**
Punjab National Bank	6	10	10	10	4 (tie)	11	**10**

Table 4: Year-Wise Composite CAMELS Score Trend (Selected Banks)

Bank	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
HDFC Bank	0.67	0.68	0.67	0.68	0.63	0.65	0.64	0.65	0.66	0.67
Kotak Mahindra	0.58	0.59	0.60	0.61	0.57	0.59	0.58	0.60	0.60	0.61
SBI	0.47	0.46	0.44	0.43	0.48	0.50	0.51	0.52	0.53	0.54
Punjab National Bank	0.40	0.38	0.32	0.31	0.34	0.36	0.37	0.38	0.39	0.40

Note: FY20 scores reflect COVID-19 stress impact. SBI trend shows consistent post-reform recovery. PNB FY18–FY19 trough reflects Nirav Modi fraud impact on asset quality.

Table 5: Detailed CAMELS Component Score Analysis by Dimension

Dimension	Top Performer	Bottom Performer	Private Avg Score	Public Avg Score
C – Capital Adequacy	Kotak Mahindra (0.712)	Union Bank (0.378)	0.617	0.375
A – Asset Quality	HDFC Bank (0.748)	Punjab National (0.312)	0.665	0.399
M – Management Quality	Axis Bank (0.687)	Punjab National (0.398)	0.586	0.473
E – Earnings	HDFC Bank (0.721)	Punjab National (0.312)	0.645	0.402
L – Liquidity	State Bank of India (0.698)	Kotak Mahindra (0.421)	0.418	0.607
S – Sensitivity	IndusInd Bank (0.621)	SBI (0.324)	0.549	0.311