Journal of Information Systems Engineering and Management
2025, 10(41s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Impact of FinTech Adoption on Bank Performance Using CAMEL Model: A Study of Selected Indian Banks

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ARTICLE INFO

Received: 26 Dec 2024

Revised: 14 Feb 2025

Accepted: 22 Feb 2025

ABSTRACT

Introduction: The integration of Fintech into the banking sector in India has been transformative, driven by technological advancements and the need for enhanced customer experiences. Fintech adoption plays a very important role in banking sector as it utilizes technological innovation to improve accessibility, efficiency and enhancing operational effectiveness.

Objectives: The study examines the impact of fintech adoption using the CAMEL model components Capital Adequacy, Asset Quality, Management Efficiency, Earnings, and Liquidity on the performance of Indian commercial banks.

Methods: Bank performance is measured by Return on Assets & Return on Equity. Secondary data from the annual reports of selected four banks, namely State Bank of India (SBI), Punjab National Bank (PNB), Axis Bank, and HDFC Bank, was collected and analyzed through suitable statistical test such as descriptive statistics and Pooled Ordinary Least Square test using E-views.

Results: The findings reveal that Asset Quality and Management Efficiency significantly influence performance, with poor asset quality and inefficient management negatively impacting both ROA and ROE. While Capital Adequacy measures show limited or insignificant effects, Earnings exhibit a negative relationship with ROE, indicating the need to address revenue volatility. Liquidity measures present mixed results, where specific indicators adversely affect performance, highlighting the importance of optimal liquidity management. The regression results demonstrate strong model reliability, with high explanatory power and no autocorrelation issues.

Conclusions: These findings suggest that banks must focus on improving asset quality, enhancing managerial practices, and maintaining stable liquidity to strengthen their financial performance. The study contributes to the understanding of bank performance drivers in the Indian context and provides actionable insights for policymakers, managers, and stakeholders. Future research can explore additional performance indicators and external macroeconomic factors to develop a more comprehensive understanding of bank performance determinants.

Keywords: Fintech Adoption, CAMEL, Bank Performance, Return on Asset, Return on Equity

INTRODUCTION

The domain of financial technology, commonly referred to as fintech (Chen, & Yang, 2019; Dorfleitner, 2017; Lien, 2020; Thakor, 2020), constitutes a significant paradigm shift within the financial services sector, utilizing technological advancements to improve the accessibility, efficiency, and user-centricity of financial offerings (Manali, et al., 2024). Fintech symbolizes a groundbreaking convergence of finance and technology that is redefining the contours of financial services. This swiftly advancing industry encompasses a diverse array of innovative applications, ranging from mobile banking solutions and investment platforms to cryptocurrencies and blockchain innovations (Takor, 2020). By employing state-of-the-art digital technologies, fintech enterprises are disrupting conventional financial frameworks and providing more accessible, efficient, and user-oriented alternatives to traditional banking and financial services (Aggarwal, 2023; Philippon, 2019).

Journal of Information Systems Engineering and Management
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Research Article

The emergence of fintech has been driven by several pivotal elements, such as advancements in technology, shifting consumer expectations, and the imperative for more inclusive financial ecosystems (Bhattacharjee, et al., 2024; Nnaemeka, et al., 2024). The increasing use of smartphones and high-speed internet has facilitated the creation of mobile-centric financial solutions, empowering users to oversee their financial affairs at their convenience. Alongside, artificial intelligence and machine learning are being utilized to refine risk evaluation, enhance fraud detection, and deliver personalized financial counsel (Zhu et al., 2021).

Fintech advancements extend beyond consumer-oriented applications. They are also revolutionizing backend operations within financial institutions, enhancing operational effectiveness, and enabling more advanced data analytics for improved decision-making (Adesola et al., 2024; Taherdoost 2023). Furthermore, fintech plays a crucial role in promoting financial inclusion by providing services to underserved populations and small businesses that have historically been overlooked by conventional financial institutions.

The Indian banking industry has experienced a significant metamorphosis in recent years, predominantly propelled by the swift emergence and integration of financial technology (fintech) services (Yadav et al., 2024; Muley et al., 2024). This digital revolution has reconfigured the traditional banking framework, presenting both challenges and prospects for established financial entities (Virdi, A.S., et al.,2023). The assimilation of fintech solutions has not only transformed the delivery of banking services but has also fundamentally modified consumer interactions with and perceptions of financial services.

Fintech advancements have instigated a paradigmatic shift in domains such as payment mechanisms, lending methodologies, asset management, and customer engagement (Manda et al., 2024; Maurya et al., 2022). Mobile banking applications, digital wallets, and peer-to-peer lending platforms have become increasingly widespread, providing convenience and accessibility to a broader spectrum of consumers, including those in remote and underserved regions (Manju et al., 2024) This digital transformation has also resulted in enhanced operational efficiency, cost reductions, and improved risk management capacities for banks.

The most significant indicator for assessing a bank's performance is its financial structure. The CAMEL framework, which stands for capital adequacy, asset quality, management competency, earning quality, and liquidity, is a popular financial indicator that has been used by previous studies to assess bank performance (Muhammed et al., 2015). “CAMEL” is a supervisory rating system used “for evaluating banks’ overall financial Performance was adopted by the Federal Financial Institutions Examination Council (FFIEEC) in 1979. CAMELS is an acronym signifying Capital adequacy, Asset quality, Management capability, Earnings, Liquidity, and Sensitivity to market risk (Abuzarqa et al., 2021).

The two important parameters for assessing the performance of banks are the return on equity and return on assets (Dincer et al. 2018). When it comes to decision-making, ROA is crucial for both internal and external stakeholders. due to the fact that ROA is associated with production or distribution performance. The ratio of profit before taxes to total assets is known as ROA (Kayani et al., 2023).

LITERATURE REVIEW

As the evolution of fintech progresses, the Indian banking sector stands at a pivotal crossroads. Financial institutions are increasingly acknowledging the imperative to engage in partnerships with fintech enterprises, integrate emergent technologies, and reconceptualize their operational frameworks to maintain relevance within this swiftly transforming financial milieu (Kayed et al., 2024). This ongoing metamorphosis is not only redefining the banking landscape but also carries extensive ramifications for financial inclusion, economic advancement, and the comprehensive growth of India's digital economy (Chouhan et al., 2023). Wu et al., (2023) concluded that banking industry has experienced profound changes in recent years, propelled by the swift progression of financial technology (fintech). The repercussions of fintech on banking efficacy are intricate, impacting diverse dimensions of banking operations and strategic direction. Principal domains of influence encompass operational efficiency, client acquisition and retention, revenue diversification, and risk management (Chernoff et al., 2024). Fintech innovations possess the capacity to optimize processes, reduces expenditures, and increase productivity within banking institutions & furthermore, they facilitate the creation of pioneering digital offerings that can entice prospective clients and enhance allegiance among stakeholders (Le et al., 2024). The integration of fintech also presents banks

Journal of Information Systems Engineering and Management
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e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

with avenues to broaden their revenue sources and secure a competitive advantage in an increasingly fluid financial services environment (Kayed et al., 2024). To thoroughly evaluate the results of fintech on banking performance, scholars frequently utilize a blend of quantitative and qualitative methodologies. This comprehensive analysis fosters a sophisticated comprehension of the intricate relationship between technological innovation and banking performance within the contemporary financial domain. The CAMELS framework represents a thorough paradigm employed by regulatory bodies to appraise the performance and stability of banking entities (Pradhan et al., 2023). This methodology is particularly advantageous for gauging banking performance as it offers an all-encompassing evaluation of a bank's fiscal robustness and operational efficacy. By scrutinizing these six pivotal aspects, regulators and analysts can derive insights into a bank's overall status, pinpoint potential vulnerabilities, and juxtapose performance among various institutions (Akter et al., 2018). The CAMELS framework facilitates a standardized assessment technique that accounts for both quantitative financial indicators and qualitative elements such as managerial quality, rendering it a resilient instrument for evaluating the soundness and sustainability of banking operations. Additionally, this paradigm aids in the early identification of financial distress, fosters risk-based oversight, and enhances transparency within the banking sector, ultimately reinforcing the stability of the financial system at large (Kumar et al., 2018). By employing CAMELS, researchers can execute comparative evaluations, monitor performance fluctuations over time, identify areas of significant fintech influence, and appraise banks' stability in the context of technological disruptions, thereby providing a structured methodology to assess the multifaceted impacts of fintech on banking operations (Kayani et al., 2023).

Capital Adequacy

One indicator of a bank's financial stability is its capital adequacy. The capital adequacy ratio evaluates a bank's ability to fulfil its goals on time as well as risk indicators like credit, market, and operational risk. It measures the amount of money being used to maintain the risky assets held by the banks. (Dincer H, et al., 2011). Capital Adequacy is measured by Capital Adequacy Ratio & Debt-Equity Ratio.

H1: There is Significant impact of Capital Adequacy on Bank Performance

Asset Quality

The performance of assets, especially in the context of bank loans, is a critical factor when assessing the quality of assets. Asset quality incorporates the degree of asset diversification, the volume and duration of loans, the evolution of the loan portfolio, the integrity of collateral securing individual loans, the existence of targeted or policy-driven lending practices, and the engagement in related party lending, which together constitute the essential factors influencing asset quality.

H2: There is significant impact of Asset Quality on Bank Performance.

Management Efficiency

Management efficiency constitutes a critical component of the CAMEL Model. The metrics encompassed within this domain require a qualitative evaluation to assess the effectiveness and productivity of management practices. The indices employed to assess management efficiency are identified as business per Employee and Profit per Employee. Management efficiency refers to the ability of management to alleviate various types of risks that are inherent to any banking operation, especially when it implements cost control measures and improves productivity, ultimately leading to enhanced profitability (Pekkaya, et al., 2018).

H3: There is significant impact of Management Efficiency on Bank Performance

Earning Quality

The standard of earnings is a significant measure that denotes the high level of a bank's profitability and its capacity to uphold excellence while producing revenue consistently. It fundamentally evaluates the bank's profitability and clarifies its capacity for sustainability and the expansion of future earnings. (Mishra, et al., 2013). Earning was calculated by operating profit as percentage of Working Capital.

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Research Article

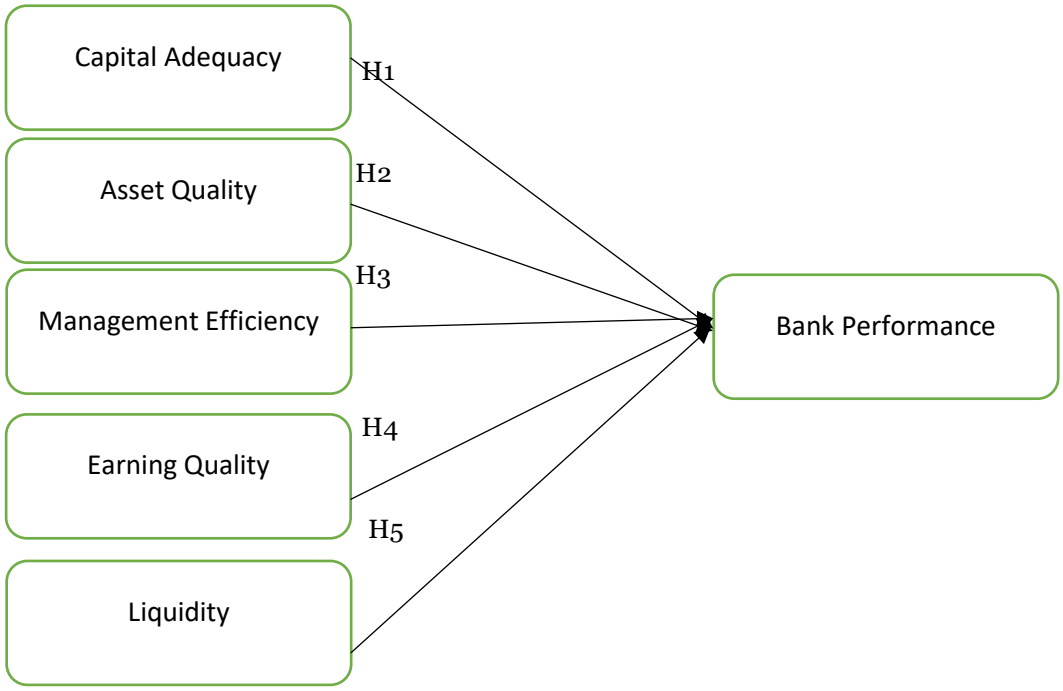
H4: There is significant impact of Earning Quality on Bank Performance.

Liquidity

Adequate liquidity is essential for proficient risk management, ensuring that financial institutions can effectively respond to unexpected withdrawals or economic pressures. The CAMEL framework highlights the necessity of preserving adequate liquidity as a protective measure against possible market variances (Agustina & Jiblathar, 2023). Liquidity is measured by credit deposit ratio, ratio of Government Securities to Total Investment, and Current Ratio.

H5: There is significant impact of Liquidity on Bank Performance

Fig. 1 Research Framework



OBJECTIVES

The objective of this study focuses on evaluating the impact of the CAMEL model components—Capital Adequacy, Asset Quality, Management Efficiency, Earnings, and Liquidity—on the financial performance of four major Indian banks: SBI, PNB, HDFC, and Axis Bank over a 10-year period. The study measures bank performance using key indicators such as Return on Assets (ROA) and Return on Equity, providing insights into the relationship between CAMEL factors and bank performance. The need for this study arises from the increasing challenges faced by banks in maintaining financial stability and performance amidst changing regulatory environments, rising non-performing assets, and intense competition. By identifying which components of the CAMEL model significantly influence performance, the study aims to help bank managers, policymakers, and stakeholders make informed decisions to strengthen operational efficiency, enhance asset quality, and ensure effective management practices.

METHODS

The present investigation employed a quantitative research methodology predicated on secondary data sourced from the annual reports of four commercial banking institutions in India: State Bank of India (SBI), Punjab National Bank (PNB), Axis Bank, and HDFC Bank. The selection of these banks was justified by their substantial influence within the Indian banking landscape and the accessibility of extensive and credible financial data encompassed in their annual reports. The research concentrated on the individual components of the CAMEL model, namely Capital Adequacy, Asset Quality, Management Efficiency, Earnings, and Liquidity, which were treated as independent

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Research Article

variables, while Return on Assets (ROA) and Return on Equity (ROE) were regarded as the dependent variables for the assessment of banking performance. Descriptive statistical methods were employed to encapsulate the central tendencies and the variability of the financial indicators, while regression analysis was utilized to evaluate the influence of the CAMEL model components on banking performance. To verify the integrity of the regression analysis, the normality of the dataset was examined, and in cases where deviations from normality were identified, data transformation techniques including logarithmic transformation and Box-Cox transformation were employed to achieve a normal distribution and fulfil the requirements of parametric testing. Subsequently, the regression model was executed to ascertain the significance and robustness of the relationships between the independent variables (CAMEL components) and the dependent variables (ROA and ROE).

Regression Model

The study follows the functional model, where model is tested on cross-sectional bank level data in context of Indian Banks over the period from 2015-2024. To examine the effect of CAMEL variables on banks' performance, this study used Pooled Ordinary Least Square (POLS). For testing purpose, following model was used:

ROA = $\beta_0 + \beta_1 CA + \beta_2 AQ + \beta_3 M + \beta_4 EQ + \beta_5 L$

ROE = $\beta_0 + \beta_1 CA + \beta_2 AQ + \beta_3 M + \beta_4 EQ + \beta_5 L$

Table 1 shows the variables which was represents by different ratios. Different ratios are used to measure independent variables which shows impact on dependent variables. Following is the summary of variables to measure the model.

Table 1: Summary of variables

Variables	Acronym	operationalization
Dependent Variables		
Return on Assets	ROA	Net Income/Total Asset
Return on Equity	ROE	Net Income/Average Shareholders' Equity
Independent Variables		
Capital Adequacy (CA)	CA1	Tier 1 capital+ Tier 2 capital/Risk Weighted Assets
	CA2	Total Debt/Total Shareholders' Equity
Asset Quality (AQ)	AQ1	Net NPA/Net Advance
Management Efficiency(M)	M1	Business Per Employee
	M2	Profit Per Employee
Earning Ability (EQ)	EQ	Operating Profit as percentage of working capital

Journal of Information Systems Engineering and Management
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https://www.jisem-journal.com/

Research Article

Liquidity (LQ)	LQ1	Total Advances/Total Deposits
	LQ2	Government Securities/Total Investment
	LQ3	Current Assets/Current Liabilities

RESULTS

Table 2: Descriptive Statistics

Variables	MEAN	STD. DEV	SKEWNESS	KURTOSIS	P-VALUE
ROA	0.8157	0.9363	-0.3615	2.7419	0.6119
ROE	961.2330	387.5244	-0.6488	2.7556	0.2338
CA1	15.0472	2.5943	-0.1561	2.4305	0.7036
CA2	1.3662	0.5435	-0.0437	1.8451	0.3270
A	0.2750	1.1896	0.1472	1.5912	0.1779
M1	2.8548	0.2524	0.3597	3.2926	0.6048
M2	1.0042	1.1513	-0.1124	2.6274	0.8540
EQ	2.3935	0.8004	0.3437	1.5091	0.1057
L1	80.1627	10.7197	-0.0191	2.0352	0.4598
L2	0.7860	0.0585	0.0071	3.0352	0.9987
L3	1.2266	0.4224	0.6949	2.8520	0.1963

The descriptive statistics provide insights into the variables used in the analysis. Return on Assets (ROA) has a mean of 0.8157 and a standard deviation of 0.9363, with slight negative skewness (-0.3615) and a kurtosis of 2.7419, indicating near-normal distribution (p=0.6119). Return on Equity (ROE) shows a high mean of 961.2330 with a standard deviation of 387.5244, exhibiting moderate negative skewness (-0.6488) and a kurtosis of 2.7556 (p=0.2338), suggesting no significant deviation from normality. Capital adequacy ratios (CA1 and CA2) have means of 15.0472 and 1.3662, respectively, with low skewness and kurtosis values, and non-significant ppp-values (p=0.7036 for CA1 and p=0.3270 for CA2), indicating normality. Asset quality (A) and management measures (M1 and M2) also display normal distribution characteristics (p>0.05) with moderate standard deviations. Earnings (EQ) has a mean of 2.3935 and exhibits low skewness (0.3437) and platykurtic behavior (kurtosis = 1.5091, p=0.1057). Liquidity variables (L1, L2, and L3) demonstrate stability, with L2 showing the lowest standard deviation (0.0585) and an almost perfect normal distribution (p=0.9987). Overall, the variables are well-distributed, with no extreme deviations from normality, supporting the suitability of these data for further regression analysis.

Normality Test

The descriptive statistics revealed that variables did not follow a normal distribution, necessitating transformations to meet the assumptions of regression analysis. To address this, Box-Cox transformation was applied to Return on Equity (ROE) to achieve normality Roe was not normal – boxcox transformation method is used by applying ROE = (shifted_ROE^lambda - 1) / lambda, where value of Lambda is 2, to make it normal data. Additionally, variables such as Asset Quality (A1), Management Efficiency (M1), and Liquidity (L3) were transformed using log transformation to correct their distribution and reduce skewness. These transformations ensured that the data met the statistical assumptions required for robust regression analysis, thereby enhancing the reliability and accuracy of the results.

Multicollinearity

To measure multicollinearity among the independent variables, the Variance Inflation Factor (VIF) test was conducted. The results indicated that two variables, A2 (Asset Quality) and E1 (Earnings), had VIF values exceeding

Journal of Information Systems Engineering and Management
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e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

the threshold of 10, suggesting a high degree of multicollinearity. As a result, these variables were removed from the model to ensure the stability and reliability of the regression analysis. After removing A2 and E1, the remaining variables exhibited VIF values below 10, confirming that multicollinearity was no longer a concern and ensuring the validity of the regression results.

Table 3 Hypothesis Results

Dependent Variable: ROA

	ROA			
	Coefficient	**t-stat**	**P-value**	**Result**
Ca1	0.0601	3.3654	0.002	Supported
Ca2	0.0773	0.8030	0.428	Not Supported
A	-0.1946	-3.4737	0.016	Supported
M1	-1.3154	-7.0205	0.000	Supported
M2	0.6255	12.0642	0.000	Supported
E2	0.0780	1.0140	0.318	Not Supported
L1	-0.0199	-3.4959	0.001	Supported
L2	-0.1212	-0.1804	0.858	Not Supported
L3	-0.0749	-0.6378	0.528	Not Supported
R-Squared	0.982053			
Adjusted R-Squared	0.976669			
F-Statistics	182.3973			
Durbin-Watson Stat	2.089932			

The regression analysis reveals that several components of the CAMEL model significantly influence bank performance as measured by Return on Assets (ROA). Capital adequacy ratios show mixed results, with Ca1 (β=0.0601, p=0.002) significantly supporting the hypothesis, while Ca2 (p=0.428) does not. Asset quality, represented by (A (β=−0.1946, p=0.016)), is negatively associated with ROA, indicating a significant impact. Management performance is highlighted by M1 (β=−1.3154, p=0.000) and M2 (β=0.6255, p=0.000), both significantly affecting ROA. Earnings, represented by E2 (p = 0.318), and liquidity measures L2 (p=0.858) and L3 (p=0.528), show no significant relationship with ROA. However, L1 (β=−0.0199, p = 0.001) significantly impacts ROA negatively. The model's robustness is confirmed by an R^2 of 0.9821, adjusted R^2 of 0.9767, and an F-statistic of 182.40, indicating strong explanatory power. The Durbin-Watson statistic (2.0899) suggests no autocorrelation issues. Overall, the findings partially support the hypothesis, highlighting the significance of capital adequacy, asset quality, management efficiency, and specific liquidity measures in determining bank performance.

Table 4

Dependent variable: ROE

	ROE			
	Coefficient	**t-stat**	**P-value**	**Result**
C	4213.552	7.7587	0.000	
Ca1	18.5563	1.5373	0.134	Not Supported
Ca2	-0.3797	-0.0058	0.995	Not Supported
A	-147.0301	-3.8884	0.000	Supported
M1	-517.5005	-4.0927	0.000	Supported
M2	293.7100	8.3933	0.000	Supported
E2	-191.0330	-3.6791	0.000	Supported

Journal of Information Systems Engineering and Management
2025, 10(41s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

L1	-9.3561	-2.4263	0.021	Supported
L2	-1246.466	-2.7493	0.010	Supported
L3	-98.7875	-1.2466	0.222	Not Supported
R-Squared	0.952280			
Adjusted R-Squared	0.937965			
F-Statistics	66.52039			
Durbin-Watson Stat	2.261373			

The regression analysis examining the impact of CAMEL model components on bank performance, measured by Return on Equity (ROE), shows significant relationships for specific variables. Capital adequacy measures (Ca1, p=0.134p; Ca2, p=0.995) are not statistically significant. Asset quality (A, β=−147.0301, p=0.000) negatively affects ROE, indicating a significant impact. Management efficiency, represented by M1 (β=−517.5005, p=0.000) and M2 (β=293.7100, p=0.000), significantly impacts ROE, with M2 showing a positive relationship. Earnings (E2, β=−191.0330, p=0.000) have a significant negative effect. Among liquidity measures, L1 (β=−9.3561, p=0.021) and L2 (β=−1246.466, p=0.010) significantly impact ROE negatively, whereas L3 (p=0.222) is not significant. The model demonstrates strong explanatory power with an R^2 of 0.9523 and an adjusted R^2 of 0.9380, supported by an F-statistic of 66.52. The Durbin-Watson statistic (2.2614) suggests no autocorrelation issues. These results highlight that asset quality, management efficiency, earnings, and specific liquidity measures significantly influence bank performance as measured by ROE, while capital adequacy shows no significant impact.

Table 5: Breusch -Pagan Test

Lagrange Multiplier Tests for Random effects

Null Hypothesis: No effects

Alternative Hypothesis: Two sided (Breusch – Pagan) & one sided (all other) alternatives

	CROSS SECTION	**TIME**	**BOTH**
ROA	0.781484	2.306914	3.088398
	(0.3767)	(0.1288)	(0.0789)
ROE	0.806622	0.493422	1.300044
	(0.3691)	(0.4824)	(0.2542)

The Lagrange Multiplier (LM) test for Random Effects was conducted to determine the presence of individual and time effects in the panel data model. The null hypothesis states that there are no significant effects, while the alternative hypothesis suggests significant effects, tested through Breusch-Pagan (two-sided) and other one-sided alternatives. For ROA, the test statistics were 0.781484 for cross-section effects, 2.306914 for time effects, and 3.088398 for both cross-section and time effects, with corresponding p-values of 0.3767, 0.1288, and 0.0789. Since the p-values exceed the significance level of 0.05, none of these tests show strong evidence to reject the null hypothesis, indicating that there are no significant cross-section, time, or combined effects on ROA. For ROE, the test statistics were 0.806622 for cross-section effects, 0.493422 for time effects, and 1.300044 for both effects combined, with p-values of 0.3691, 0.4824, and 0.2542, respectively. Again, the p-values are all greater than 0.05, meaning there is no significant evidence of cross-section, time, or combined effects on ROE.

As the p-value of Breush Pagan Test for cross section and time element is more than 0.05 so we fail to reject the null hypothesis which means that pooled OLS is preferable. We will have to consider pooled OLS in our regression.

DISCUSSION

The findings of the study highlight how the CAMEL model components influence bank performance, measured by ROA and ROE, for SBI, PNB, HDFC, and Axis Bank over a 10-year period. Capital adequacy, represented by CA1 and

Journal of Information Systems Engineering and Management
2025, 10(41s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

CA2, shows limited impact, as CA1 positively affects performance but remains statistically insignificant for ROE, while CA2 does not exhibit any notable influence. Asset quality, measured by A, significantly impacts both ROA and ROE, showing a negative relationship, indicating that poorer asset quality reduces bank performance. Management efficiency, represented by M1 and M2, plays a critical role, with M1 having a strong negative impact on both ROA and ROE, while M2 positively contributes to performance, highlighting its role in enhancing management-driven outcomes. Earnings, captured by EQ, demonstrate a significant negative effect on ROE, suggesting that higher earnings volatility undermines bank profitability. Liquidity measures show mixed results. L1 negatively impacts both ROA and ROE, L2 significantly reduces ROE, while L3 does not display any significant influence. Overall, the CAMEL components, particularly asset quality, management efficiency, and specific liquidity indicators, play a significant role in shaping bank performance, emphasizing the need for banks to focus on improving asset quality, effective management practices, and maintaining optimal liquidity to enhance their profitability and operational efficiency.

LIMITATION

The primary limitation of this research lies in the scope of the data, which focuses on only four major banks—SBI, PNB, HDFC, and Axis Bank—over a 10-year period. While these banks represent significant players in the Indian banking sector, the findings may not fully generalize to smaller banks, regional banks, or other financial institutions. Future research could expand the scope by incorporating more banks, additional performance indicators, and external macroeconomic factors to provide a broader perspective on the determinants of bank performance.

POLICY IMPLICATION

This study's findings suggest various policy recommendations for improving the performance and stability of the Indian banking system. Policymakers and regulatory bodies, including the Reserve Bank of India (RBI), must emphasize the enhancement of asset quality by implementing stricter credit appraisal standards and enhancing systems to oversee and manage non-performing assets (NPAs). Due to the significant impact of management efficiency on bank performance, it is essential to require regular evaluations of managerial effectiveness and promote capacity-building initiatives to enhance managerial oversight and strategic decision-making. Moreover, the mixed effects of liquidity indicators indicate that banks must implement improved liquidity management frameworks in accordance with Basel III standards, establishing a proper balance between short-term obligations and long-term funding requirements. While capital adequacy exhibited a minimal direct influence on profitability in our study, the continued existence of significant capital buffers is crucial for systemic stability and should persist through risk-sensitive regulatory capital requirements. The negative correlation between earnings volatility and profitability emphasizes the necessity of policies that encourage revenue diversification and operational cost management. These findings emphasize the necessity for a cohesive regulatory strategy that strengthens the CAMEL components as both a diagnostic instrument and a foundation for proactive oversight and policy formulation in the Indian banking sector.

CONCLUSION

The study highlights the significant impact of the CAMEL model components on bank performance, measured by ROA and LOG_ROE, providing key insights into areas requiring improvement. Based on the findings, it is suggested that banks focus on enhancing asset quality by reducing non-performing assets and improving credit management practices, as poor asset quality significantly hampers performance. Management efficiency must be strengthened through better operational controls, resource optimization, and strategic decision-making to balance its positive and negative effects on profitability. Furthermore, liquidity management strategies should be revisited to ensure optimal levels, as improper liquidity can adversely affect performance. While capital adequacy showed limited influence, banks should continue maintaining healthy capital reserves to absorb shocks during financial stress. Earnings volatility must be addressed by diversifying revenue streams and improving cost efficiency to sustain long-term profitability. In conclusion, the study emphasizes that banks need to adopt a balanced approach to managing capital adequacy, asset quality, management efficiency, earnings stability, and liquidity to enhance overall performance. Future research could expand the scope by incorporating more banks, additional performance indicators, and external macroeconomic factors to provide a broader perspective on the determinants of bank performance.

Journal of Information Systems Engineering and Management
2025, 10(41s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

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