IJAMESC, Vol. 3 No. 6, December 2025
DOI: https://doi.org/10.61990/ijamesc.v3i6.635 e-ISSN 2986-8645

MANAGEMENT EFFICIENCY AND FINANCIAL OUTCOMES IN PRIVATE SECTOR BANKS: AN EMPIRICAL STUDY

Anmol Kumari[1]*, Anup Kumar Roy[2]
[1.2]Department of Commerce, Guru Ghasidas Vishwavidyalaya University, India
*Corresponding Author:
anmolsah1804@gmail.com

Abstract
In the evolving landscape of India's banking industry, private sector banks play a significant role in promoting innovation, efficiency, and financial inclusion. Their financial performance is closely tied to how effectively they manage operational resources and human capital. This study aims to analyse the impact of management efficiency on the financial performance of selected private sector banks in India. Specifically, it investigates how efficiency indicators such as cost control and employee productivity influence Return on Assets (ROA), a key measure of profitability. The research covers an eleven-year period from 2013-2014 to 2023-2024, using panel data from five major private sector banks. The analysis employs descriptive statistics, multicollinearity and heteroscedasticity diagnostics, and panel regression through the Pooled Ordinary Least Squares (OLS) technique. Five efficiency indicators - Cost to Income Ratio (CIR), Business per Employee (BPE), Profit per Employee (PPE), Investment to Employment Ratio (IER), and Deposit to Employment Ratio (DER) are used as independent variables, with ROA as the dependent variable. The results indicate that CIR, BPE, PPE, and DER have a statistically significant effect on ROA, while IER does not show a notable impact. The model displays a high level of explanatory power, with an R-squared value of 0.9291, suggesting that approximately 93% of the variation in ROA is accounted for by the selected variables. The findings highlight the importance of operational efficiency and effective human resource management in enhancing profitability. The study offers valuable insights for bank managers and policymakers seeking to optimize performance through strategic efficiency improvements in cost management and employee productivity.

Keywords: Management Efficiency, Financial Performance, Private Sector Banks, Return on Assets (ROA), Pooled OLS

1. Introduction

The banking industry serves as the cornerstone of the financial system, playing a pivotal role in fostering economic growth, ensuring stability, and driving development. Within this ecosystem, private sector banks emerge as critical agents of competition, innovation, and financial inclusion. Their financial health and performance are therefore subjects of intense scrutiny, serving as barometers not only for profitability but also for the efficacy of their resource and risk management practices. Among the myriad factors influencing bank performance, management efficiency stands out as a fundamental determinant of sustainable success. Efficient management, particularly in areas of cost control and operational streamlining, is paramount for enhancing a bank's profitability and long-term viability.

Management efficiency in banking is typically gauged through specific operational metrics. Key among these is the Cost-to-Income Ratio (CIR), which evaluates the

proportion of operating expenses consumed to generate income, and Business per Employee (BPE), a measure of workforce productivity. A lower CIR and a higher BPE are indicative of superior managerial efficiency (Berger & DeYoung, 1997; Sufian & Habibullah, 2009). The ultimate reflection of this efficiency is captured in the bank's financial performance, most commonly measured by Return on Assets (ROA). ROA demonstrates how effectively a bank utilizes its total asset base to generate profits, making it a comprehensive indicator of both profitability and operational efficiency (Goddard et al., 2004).

Extant literature has firmly established a connection between management efficiency and financial performance, suggesting that banks with higher operational efficiency tend to achieve greater profitability and stability. However, while studies such as those by Goddard et al. (2004) have highlighted the importance of factors like bank size and capital adequacy, there remains a need for more nuanced, context-specific empirical analysis. The research gap addressed in this study lies in the detailed examination of how specific, granular indicators of management efficiency extending beyond CIR and BPE to include Profit per Employee (PPE), Investment Employment Ratio (IER), and Deposit Employment Ratio (DER) collectively and individually impact the financial performance (ROA) of private sector banks. This is particularly urgent within the context of India's rapidly expanding and competitive private banking sector, where understanding the precise drivers of profitability is crucial for strategic decision-making.

The urgency of this research is underscored by the dynamic regulatory environment and intense competition in the Indian banking landscape. Stakeholders including bank managers, investors, and policymakers require evidence-based insights to navigate this complexity. Managers need clarity on which efficiency levers most significantly impact the bottom line; investors seek robust metrics to evaluate operational health; and regulators benefit from understanding how managerial practices influence systemic stability.

To address the identified research gap, this study aims to achieve the following integrated objectives: First, to examine the financial performance of selected private sector banks using Return on Assets (ROA) as the primary measure of profitability. Second, to assess the fundamental role of management efficiency in influencing banks' financial outcomes. Third, to conduct a comprehensive analysis of key management efficiency indicators, encompassing the Cost to Income Ratio (CIR), Business per Employee (BPE), Profit per Employee (PPE), Investment Employment Ratio (IER), and Deposit Employment Ratio (DER). Fourth, to map the longitudinal trends and patterns in these variables across an eleven-year observation period within the selected banks. Finally, to empirically assess the precise linkages between these efficiency indicators and financial performance through rigorous panel data analysis.

The significance of this study is multi-faceted. For bank managers, the findings will provide actionable insights for strategic planning in cost management, human resource deployment, and asset utilization. Investors and analysts can utilize the established relationships between efficiency metrics and ROA to make more informed investment decisions and valuations. For policymakers and regulators, this research offers empirical evidence on how micro-level managerial efficiency translates into macro-level financial health, potentially informing policies aimed at enhancing the robustness and productivity of the banking sector.

2. Theoretical Background

2.1 Financial Performance in Banking: The Role of Return on Assets (ROA)

Management efficiency plays a pivotal role in determining the financial performance of private sector banks. Among the various indicators used to assess financial outcomes, Return on Assets (ROA) is one of the most widely accepted measures. It reflects how effectively a bank utilizes its total assets to generate net income. According to Athanasoglou et al. (2008), ROA is primarily driven by internal, bank-specific factors such as cost efficiency, capital structure, and asset management capabilities. Alper and Anbar (2011) also found that banks with better cost control and optimal utilization of labour and capital resources tend to report higher ROA. These findings highlight the appropriateness of using ROA as the dependent variable in empirical studies focused on evaluating efficiency of managerial performance in the banking industry.

2.2 Cost Management Efficiency: Cost-to-Income Ratio (CIR)

The CIR is considered one of the key indicators of management efficiency, as it reflects the percentage of a bank's operating expenses relative to its income. A lower CIR indicates better cost management and higher operational efficiency. Several empirical studies support this view. For instance, research by Pasiouras, Tanna, and Zopounidis (2009) found that banks with strong governance practices and effective cost control tend to achieve superior profitability. Similarly, Tan and Floros (2012), in their analysis of Chinese banks, concluded that improved operational cost efficiency positively influences overall bank performance. Together, these findings highlight a negative correlation between CIR and ROA, suggesting that as banks become more efficient in managing costs (i.e., as CIR decreases), their financial performance tends to improve.

2.3 Human Capital Productivity Metrics

2.3.1 Business per Employee (BPE)

Another important labour productivity metric is Business per Employee (BPE), which captures how efficiently a bank's workforce contributes to the generation of core business activities, typically measured as the sum of deposits and advances per employee. Studies by Sufian and Habibullah (2009) and Isik and Hassan (2002) demonstrate that higher employee productivity is positively associated with profitability indicators like ROA. Efficient deployment and training of human capital allow banks to increase service output per employee, thereby enhancing operational and financial performance. In the Indian context, the adoption of digital technologies and automation in private banks has significantly elevated BPE values, reflecting improved workforce efficiency.

2.3.2 Profit per Employee (PPE)

Profit per Employee (PPE) is another relevant measure of human capital efficiency, indicating how much net income each staff member contributes. It is widely viewed as a direct reflection of managerial effectiveness and workforce alignment with strategic goals. While Berger and DeYoung (1997) primarily focused on the implications of poor management on operational inefficiencies, their findings support the broader perspective that well-managed banks with strategically deployed human resources tend to generate higher PPE, which positively influences ROA.

2.4 Specialized Efficiency Indicators

2.4.1 Investment-Employment Ratio (IER)

The Investment-Employment Ratio (IER), though less frequently addressed in empirical banking studies, serves as an indicator of how well banks allocate capital through their workforce. A higher IER may signal more effective use of investments per employee, indicating stronger capital productivity. Koch and MacDonald (2006), in their work on bank management, emphasize that aligning capital investment with skilled labour can enhance operational efficiency and profitability. For private sector banks in India, where investment in technology and upskilling is increasing, IER may serve as a useful indicator of long-term financial health and asset productivity.

2.4.2 Deposit-Employment Ratio (DER)

Lastly, the Deposit-Employment Ratio (DER) offers insights into a bank's deposit mobilization capabilities relative to its staff strength. This ratio is a useful proxy for measuring resource mobilization efficiency and employee productivity in customer acquisition and retention. Although Goddard, Molyneux, and Wilson (2004) do not directly analyse DER, their findings support the view that efficient labour deployment positively affects bank profitability. In India's private banking landscape, where branch-level strategies and financial inclusion initiatives are increasingly prioritized, DER becomes particularly relevant in assessing how regional and operational efficiency contributes to overall financial outcomes.

2.5 Research Gap and Study Positioning

Despite extensive global research on management efficiency and financial performance in banks, there remains a significant gap in the context of Indian private sector banks. Existing studies often focus on individual efficiency indicators or foreign banking systems, limiting their applicability to India's unique economic and regulatory environment. Moreover, metrics like IER and DER are underexplored in empirical literature. There is also a lack of comprehensive, long-term panel data analysis that integrates multiple efficiency indicators to assess their collective impact on financial outcomes, particularly Return on Assets (ROA). This study addresses these gaps by employing an eleven-year panel analysis of selected Indian private sector banks, offering a more contextual and multidimensional understanding of management efficiency.

2.6 Hypotheses Development

Based on the preceding theoretical framework and literature review, this study develops five hypotheses to examine the effect of management efficiency indicators on the financial performance of banks, as measured by Return on Assets (ROA).

2.6.1 The Effect of Cost-to-Income Ratio (CIR) on ROA

The Cost-to-Income Ratio (CIR) is traditionally used as a measure of operational cost efficiency, where a lower ratio reflects better cost management. Empirical studies, such as those by Pasiouras et al. (2009) and Tan and Floros (2012), consistently find a negative relationship between CIR and bank profitability, as reducing operational costs directly improves profit margins. Based on efficiency theory and prior empirical evidence, the first hypothesis is formulated as follows:

H1: The Cost-to-Income Ratio (CIR) has a significant negative effect on the Return on Assets (ROA) of private sector banks.

2.6.2 The Effect of Business per Employee (BPE) on ROA

Business per Employee (BPE) measures workforce productivity in generating core business (deposits and advances). Literature such as Sufian and Habibullah (2009) indicates that higher employee productivity is generally associated with better financial performance, as efficient human resources can increase service output and revenue. Therefore, the second hypothesis is formulated:

H2: Business per Employee (BPE) has a significant positive effect on the Return on Assets (ROA) of private sector banks.

2.6.3 The Effect of Profit per Employee (PPE) on ROA

Profit per Employee (PPE) is a direct indicator of each employee's contribution to the bank's net profit. This ratio reflects the strategic effectiveness of human resource deployment and aligns with the Resource-Based View, where high-quality and motivated human resources are core capabilities for creating a sustainable competitive advantage (Barney, 1991). Thus, the third hypothesis is formulated:

H3: Profit per Employee (PPE) has a significant positive effect on the Return on Assets (ROA) of private sector banks.

2.6.4 The Effect of Investment-Employment Ratio (IER) on ROA

The Investment-Employment Ratio (IER) assesses capital productivity by measuring investment per employee. Investment in technology, infrastructure, and employee training is expected to enhance operational efficiency and revenue-generating capacity (Koch & MacDonald, 2006). Therefore, banks with higher investment allocation per employee are anticipated to achieve better profitability.

H4: The Investment-Employment Ratio (IER) has a significant positive effect on the Return on Assets (ROA) of private sector banks.

2.6.5 The Effect of Deposit-Employment Ratio (DER) on ROA

The Deposit-Employment Ratio (DER) measures the efficiency of mobilizing third-party funds (deposits) relative to the number of employees. The ability to efficiently gather low-cost funding is a crucial driver of banking profitability, as it reduces funding costs and improves net interest margins (Goddard et al., 2004). Hence, greater efficiency in deposit mobilization per employee is expected to positively impact ROA.

H5: The Deposit-Employment Ratio (DER) has a significant positive effect on the Return on Assets (ROA) of private sector banks.

3. Methods

3.1 Research Design and Scope

This study employs a quantitative, explanatory research design to investigate the relationship between management efficiency and the financial performance of private sector banks in India. The design is structured as a longitudinal panel study, analyzing data over an eleven-year period from the financial years 2013-14 to 2023-24. This timeframe is selected to capture long-term trends, mitigate the impact of short-term economic fluctuations, and provide a robust basis for panel data analysis.

3.2 Population, Sample, and Data Source

The study population comprises all private sector banks operating in India. A purposive sampling technique was employed to select five leading private sector banks based on the criteria of market capitalization, total assets, and consistent public

availability of detailed annual financial data over the study period. The selected banks are: HDFC Bank, ICICI Bank, Axis Bank, Kotak Mahindra Bank, and IndusInd Bank. These banks collectively represent a significant share of the Indian private banking sector, making the sample highly representative for analytical purposes. All data were collected from secondary sources, specifically the audited annual reports and financial statements published on the official websites of each selected bank. This ensures the reliability and authenticity of the data used for analysis.

3.3 Variables and Operational Definitions

The study examines one dependent variable and five independent variables. Their operational definitions, measurement formulas, and theoretical underpinnings are detailed in Table 1.

Table 1. Operational Definition of Variables

Category	Variable	Measurement Formula	Theoretical Support
Dependent Variable	Return on Assets (ROA)	(Net Profit / Total Assets) × 100	(Nyakieni, 2022); (Barus et al., 2017); (Kumbirai & Webb, 2010); (Gondaliya & Lodaliya, 2021); (Dsouza, Rabbani, Hawaldar, & Jain, 2022)
Independent Variables	Cost-to-Income Ratio (CIR)	(Operating Expenses / Operating Income) × 100	(Barus et al., 2017); (Kumbirai & Webb, 2010); (Dsouza et al., 2022)
	Business per Employee (BPE)	(Total Deposits + Total Advances) / Number of Employees	Barus et al. (2017); Gondaliya & Lodaliya (2021)
	Profit per Employee (PPE)	Net Profit / Number of Employees	Sangmi & Nazir (2010); Gondaliya & Lodaliya (2021)
	Investment-Employment Ratio (IER)	Total Investments / Number of Employees	Koch & MacDonald (2006) – Adapted
	Deposit-Employment Ratio (DER)	Total Deposits / Number of Employees	Goddard et al. (2004) – Conceptual Basis

3.4 Data Analysis Technique

To examine the impact of management efficiency indicators (CIR, BPE, PPE, IER, DER) on profitability (ROA), this study utilizes panel data regression analysis. The general form of the empirical model is specified as follows:

$$ROAit = \beta 0 + \beta 1CIRit + \beta 2BPEit + \beta 3PPEit + \beta 4IERit + \beta 5DERit + \varepsilon it$$

Where:

ROAit : The Return on Assets for bank i in year t.
β0 : The constant intercept.
β1 to β5 : The coefficients of the independent variables.
εit : The error term for bank i in year t.

The analysis was conducted using Pooled Ordinary Least Squares (Pooled OLS) regression. Prior to regression, descriptive statistics were calculated to summarize the data, and relevant diagnostic tests (such as tests for multicollinearity using Variance Inflation Factor - VIF) were performed to ensure the robustness and validity of the regression model. Data processing and analysis were conducted using statistical software EViews 12.

4. Results and Discussion

4.1 Descriptive Statistics and Data Overview

A preliminary analysis was conducted to understand the general characteristics of the dataset. Table 2 presents the descriptive statistics for all variables used in the study over the period 2013-14 to 2023-24.

Table 2. Descriptive Statistics of Research Variables

Statistic	BPE	CIR	DER	IER	PPE	ROA
Mean	13.03	43.54	1.21	32.96	0.15	1.66
Median	12.75	43.50	1.20	32.40	0.14	1.86
Maximum	21.49	58.00	1.52	53.33	0.31	2.66
Minimum	6.78	34.70	1.06	24.17	0.004	0.04
Std. Dev.	4.23	4.55	0.09	4.94	0.07	0.59
Skewness	0.20	0.35	1.22	1.39	0.50	-1.02
Kurtosis	1.81	3.38	5.24	7.07	2.80	3.47

Source: Processed from bank annual reports using Microsoft Excel.

The results in Table 2 reveal important patterns. The dependent variable, Return on Assets (ROA), has a mean of 1.66% with a negative skewness (-1.02), indicating that the distribution is skewed toward lower values, which is consistent with the presence of some poorly performing observations. Among the independent variables, Business per Employee (BPE) and Cost-to-Income Ratio (CIR) show relatively symmetric distributions. In contrast, Deposit-Employment Ratio (DER) and Investment-Employment Ratio (IER) exhibit high positive skewness and kurtosis, suggesting the presence of outlier banks with exceptionally high values. This initial variation in the data justifies the use of panel data regression to control for such heterogeneity across banks and time.

4.2. Diagnostic Tests

To ensure robust estimates, stationarity, multicollinearity, and heteroscedasticity were tested. The Levin, Lin & Chu (LLC) panel unit root test confirmed that all variables are integrated of order one [I(1)], validating the use of first-differenced data for regression to avoid spurious results.

Table 3. Multicollinearity Test using Variance Inflation Factor (VIF)

Variable	VIF	1/VIF
IER	2.95	0.339
DER	2.37	0.423
BPE	2.25	0.444
PPE	1.59	0.628
CIR	1.37	0.730
Mean VIF	2.11	

Source: Author’s computation using EViews 12.

As shown in Table 3, all Variance Inflation Factor (VIF) values are well below the conservative threshold of 5, with a mean VIF of 2.11. This indicates the absence of severe multicollinearity among the independent variables, ensuring that their individual effects on ROA can be reliably estimated.

Table 4. Heteroscedasticity Test Results (Breusch-Pagan Test)

Test	Statistic	p-Value	Conclusion
Breusch-Pagan	0.9000	0.3421	Fail to reject H_0

The null hypothesis (H_0) states that the error variance is constant (homoscedasticity). Since the p-value (0.3421) exceeds the conventional significance level of 0.05, there is insufficient evidence to reject H_0. This confirms that the model meets the homoscedasticity assumption, validating the use of Ordinary Least Squares (OLS) estimation.

Furthermore, the Breusch-Pagan test for heteroscedasticity yielded a chi-square statistic of 0.9 with a p-value of 0.3421, failing to reject the null hypothesis of homoscedasticity. This confirms that the error terms have constant variance, satisfying a critical assumption of the OLS estimator.

4.3 Regression Results and Hypothesis Testing

The results of the Pooled OLS regression are presented in Table 5. The model demonstrates a strong explanatory power, with an R-squared of 0.9291, indicating that approximately 92.9% of the variation in ROA is explained by the five management efficiency variables.

Table 5. Panel Data Regression Results (Pooled OLS)

Variable	Coefficient	Std. Error	t-Statistic	p-Value
C (Constant)	1.5896	0.5262	3.0215	0.0040
CIR	0.0284	0.0057	4.9447	0.0000
BPE	-0.1184	0.0072	-16.4583	0.0000
PPE	9.5973	0.4044	23.7318	0.0000
IER	0.0016	0.0078	0.2051	0.8382
DER	-0.9037	0.3856	-2.3439	0.0233
R-squared	0.9291	Adjusted R-squared	0.9219	
F-statistic	128.5000	Prob(F-statistic)	0.000000	

Hypothesis Discussion:

1) H1: CIR and ROA. The results show a positive and significant relationship (β=0.0284, $p<0.01$), contradicting the hypothesized negative effect. This counterintuitive finding may indicate that, within the sampled Indian private banks, higher operating expenses are associated with strategic investments in technology, talent, or market expansion that subsequently drive income and profitability at a faster rate, a phenomenon noted in growth-phase banks (Tan & Floros, 2012).
2) H2: BPE and ROA. The analysis reveals a significant negative influence (β=-0.1184, $p<0.01$), supporting the hypothesis. This suggests that an excessive business load per employee may lead to operational burnout, diminished service quality, or increased error rates, ultimately impairing profitability. It underscores a potential trade-off between sheer employee productivity and sustainable financial performance.
3) H3: PPE and ROA. A strong positive and significant effect is confirmed (β=9.5973, $p<0.01$), strongly supporting H3. This result highlights that Profit per Employee is the most potent driver of overall bank profitability in the model. It affirms that banks with

a highly skilled, efficient, and strategically aligned workforce are more successful in converting human capital into net income, aligning with the resource-based view of the firm.

4) H4: IER and ROA. The coefficient for IER is positive but statistically insignificant (p=0.838). Therefore, H4 is not supported. This implies that, in the context of this study, the level of investment per employee does not have a direct, measurable impact on short-term profitability (ROA). The benefits of capital investment may be realized over a longer horizon or through indirect channels not captured here.
5) H5: DER and ROA. The finding of a significant negative relationship (β=-0.9037, p<0.05) supports H5. A higher deposit load per employee may indicate strain on the deposit mobilization system, potentially leading to higher operational costs or lower service efficiency in managing these funds, which negatively affects returns.

4.4 Discussion of Overall Findings

The model's high explanatory power ($R^2 = 0.9291$) and overall significance (F-stat. = 128.5, p=0.000) confirm that management efficiency is a critical determinant of financial performance in Indian private banks. The most impactful driver is Profit per Employee (PPE), emphasizing the paramount importance of human capital quality over mere volume (BPE) or cost minimization (CIR). The negative impact of BPE and DER serves as a caution against overburdening employees with excessive business or deposit targets, which can be counterproductive.

The unexpected positive CIR-ROA relationship invites a nuanced interpretation, moving beyond the conventional "lower cost is always better" paradigm. It suggests that for leading, growth-oriented private banks in a competitive market like India, strategic spending is a necessary investment for future profitability. This finding aligns with studies that differentiate between productive and non-productive expenses.

The study's outcomes offer practical implications. Bank managers should prioritize strategic human resource development to boost PPE, rather than merely increasing the business volume per employee. While cost control is important, a myopic focus on minimizing CIR could stifle necessary investments for growth. Instead, a balanced approach evaluating the quality of expenditures is recommended. Furthermore, operational strategies should ensure that deposit mobilization and business expansion are supported by adequate human resource planning to avoid inefficiencies reflected in the negative BPE and DER coefficients.

5. Conclusion

This study empirically investigated the influence of management efficiency on the financial performance of selected private sector banks in India from 2013-14 to 2023-24. By employing a Pooled Ordinary Least Squares (OLS) panel data regression model, the analysis tested the relationship between Return on Assets (ROA) and five key efficiency indicators: Cost-to-Income Ratio (CIR), Business per Employee (BPE), Profit per Employee (PPE), Investment-Employment Ratio (IER), and Deposit-Employment Ratio (DER). The findings provide clear answers to the research objectives.

First, the analysis of financial performance trends confirmed that ROA is a reliable and responsive measure of bank profitability, showing significant variation across banks and time, which warranted further investigation into its drivers. Second, the assessment of management efficiency's role revealed it to be a critical determinant of financial

outcomes, with the model explaining approximately 92.9% of the variation in ROA. Third, the examination of specific efficiency indicators yielded differentiated results: PPE emerged as the most potent positive driver of profitability, while BPE and DER showed significant negative effects, and CIR demonstrated a positive relationship. IER was found to have no statistically significant impact. Fourth, the synthesis identified PPE as the most consistent and influential factor, highlighting the paramount importance of human capital quality in enhancing financial performance. Finally, the study identified a key research gap concerning the counterintuitive positive CIR-ROA relationship within the Indian private banking context, suggesting that strategic, growth-oriented expenditures may differ from mere cost minimization.

The core conclusion is that management efficiency, particularly as reflected in human capital productivity (PPE), is a fundamental pillar of profitability for Indian private banks. However, efficiency is not a monolithic concept. The findings advocate for a strategic, balanced approach to efficiency management: prioritizing investments that enhance employee value and profit contribution, while critically evaluating the trade-offs between cost control, employee workload, and deposit mobilization to avoid diminishing returns. The positive association of CIR with ROA challenges conventional wisdom and implies that for leading banks in a growth-oriented market, certain operational expenses may represent strategic investments rather than inefficiencies.

These insights offer actionable guidance for bank managers to refine resource allocation, for investors to assess operational health beyond traditional metrics, and for researchers to explore the nuanced, context-dependent nature of efficiency-performance linkages in the banking sector.

References

Alper, D., & Anbar, A. (2011). Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey. *Business and Economics Research Journal, 2(2)*, 139-152.

Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money, 1(2)*, 121-136.

Barus, J. J., Muturi, W., Kibati, P., & Koima, J. (2017). Effect of management efficiency on financial performance of savings and credit societies in Kenya. *Journal of Strategic Management*, *2*(1), 92–104.

Berger, A. N. (1995). The relationship between capital and earnings in banking. *Journal of Money, Credit and Banking, 27(2)*, 432-456.

Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of Banking & Finance*, 21(6), 849–870.

Dsouza, S., Rabbani, M. R., Hawaldar, I. T., & Jain, A. K. (2022). Impact of bank efficiency on the profitability of the banks in India: An empirical analysis using panel data approach. *International Journal of Financial Studies, 10*(4), 93. https://doi.org/10.3390/ijfs10040093

Goddard, J., Molyneux, P., & Wilson, J. O. (2004). The profitability of European banks: A cross-sectional and dynamic panel analysis. *The Manchester School, 72(3)*, 363-381.

Gondaliya, V., & Lodaliya, R. (2021). Measuring performance of private sector banks in India: A CAMELS model approach. *International Journal of Multidisciplinary Research and Publications*, *4*(6), 20–25.

Isik, I., & Hassan, M. K. (April, 2002). Technical, scale and allocative efficiencies of Turkish banking industry. *Journal of Banking & Finance; Elsevier, vol. 26(4),*, 719-766.

Koch, T. W., & MacDonald, S. S. (2006). *Bank management. 6th Edition.* Thomson South-Western.

Kumbirai, M., & Webb, R. (2010). A financial ratio analysis of commercial bank performance in South Africa. *African Review of Economics and Finance*, *2*(1), 30–53.

Nyakieni, D. A. (2022). *Effect of management efficiency on financial performance of commercial banks in Kenya*[Master's thesis, Moi University]. *Journal of Economics, Finance and Management Studies*, **5**(6), 1821–1829. https://doi.org/10.47191/jefms/v5-i6-33

Pasiouras, F., Tanna, S., & Zopounidis, C. (2009). The impact of banking regulations on banks' cost and profit efficiency: Cross-country evidence. *International Review of Financial Analysis, vol. 18, issue 5*, 294-302.

Sufian, F., & Habibullah, M. S. (2009). Bank Specific and Macroeconomic Determinants of Bank Profitability: Empirical Evidence from the China Banking Sector. *Frontiers of Economics in China, 4(2)*, 274-291.

Sangmi, M.-u.-D., & Nazir, T. (2010). Analyzing financial performance of commercial banks in India: Application of CAMEL model. *Pakistan Journal of Commerce and Social Sciences*, *4*(1), 40–55.

Tan, Y., & Floros, C. (2012). Bank profitability and GDP growth in China: a note. *Journal of Chinese Economic and Business Studies, Taylor & Francis Journals, vol. 10(3)*, 267-273.