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CAMEL Analysis of Selected Scheduled Commercial Banks in India

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The Indian banking sector has undergone significant changes over the past few decades, influenced by economic reforms, technological progress, and regulatory shifts. Scheduled Commercial Banks (SCBs) play a crucial role in the financial system by bridging the gap between depositors and borrowers. To evaluate their performance and stability, the CAMEL framework is widely employed. CAMEL represents Capital Adequacy, Asset Quality, Management Efficiency, Earnings Strength, and Liquidity. This paper offers a detailed analysis of selected Scheduled Commercial Banks in India using the CAMEL model, incorporating mathematical equations and empirical findings. The present study sheds light on the financial health of selected scheduled commercial banks in India, including public banks, private banks, foreign banks while providing valuable insights into their operational efficiency, risk management strategies, and profitability.

Keywords: camel analysis, indian banks, scheduled commercial banks, private banks, foreign banks, mathematical approach

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1. Introduction

The CAMELS rating system, initially developed by U.S. supervisory authorities in the 1980s (Gupta, 2014), provides a structured approach to evaluating the financial health and operational soundness of banking institutions. The acronym represents six key components: Capital Adequacy, Asset Quality, Management Quality, Earnings, Liquidity, and Sensitivity to Market Risk (Gupta, 2014), (Sangmi, NaN), (Kulshrestha, 2022). Each component is assessed individually, and a composite rating is then assigned, reflecting the overall condition of the bank. While the system involves some subjectivity based on examiners' overall assessments (Gupta, 2014), it offers a standardized framework for comparative analysis across banks and over time. The inclusion of Sensitivity to Market Risk, added later to make the system more risk-focused (Gupta, 2014), highlights the evolving nature of banking risks and the need for adaptable assessment tools.

Numerous studies have employed the CAMELS framework to analyze Indian scheduled commercial banks (Kalakkar, 2012), (Sahota, 2017), (Ibrahim, 2011), (Gupta, 2014). These studies vary in their scope, focusing on specific aspects of bank performance or comparing banks across different ownership structures (public, private, foreign). However, they collectively contribute to a deeper understanding of the Indian banking landscape and the effectiveness of the CAMELS framework in assessing its health.

The Indian banking sector, a cornerstone of the nation's economic growth, has undergone significant transformations driven by globalization, liberalization, and rapid industrialization. This has created a highly competitive environment where banks must prioritize profitability, efficient management, growth, and risk mitigation to ensure survival and market dominance. Analyzing the financial performance of these institutions is crucial for understanding their strengths, weaknesses, and overall contribution to the national economy. The CAMELS rating system, a globally recognized framework for evaluating bank soundness, provides a robust methodology for such an analysis. This research paper undertakes a comprehensive review of existing literature focusing on CAMEL analysis of scheduled commercial banks in India, identifying key findings, methodological approaches, and areas requiring further investigation.

Scheduled Commercial Banks (SCBs) account for a significant share of financial intermediation. The CAMEL model is a well-established framework for assessing bank performance, as it covers essential aspects of financial health such as capital adequacy, asset quality, management efficiency, earnings strength, and liquidity. This paper utilizes the CAMEL framework to evaluate the performance of major Scheduled Commercial Banks (SCBs) in India, including public sector banks, private sector banks, and foreign banks. The analysis is supported by mathematical equations and empirical data to provide a quantitative assessment of each bank's performance. The Indian banking sector has undergone significant transformation over the years, evolving from a traditional setup to a more dynamic and integrated system within the global economy. However, this evolution has also introduced challenges such as rising non-performing assets (NPAs), liquidity crises, and governance issues. To address these challenges, the CAMEL analysis framework—assessing Capital adequacy, Asset quality, Management, Earnings, and Liquidity—has become a critical tool. The studies reviewed employed various methodologies for analyzing bank performance using the CAMELS framework. Some studies utilized ratio analysis, calculating key financial ratios for each component of the CAMELS framework (Sahota, 2017), (Samuel, 2018), (Sathyamoorthi, 2017). Others employed statistical techniques such as one-way ANOVA to test for significant differences in bank performance across different ownership structures or over time (Sahota, 2017). Regression analysis was used in some studies to identify the determinants of bank profitability or to examine the relationships between CAMELS components and other financial variables (Kalakkar, 2012), (Echekoba, 2014). Panel data analysis was used in some cases to control for unobserved heterogeneity and to examine changes in bank performance over time (Sahota, 2017). The choice of methodology often depends on the specific research question and the availability of data. A comparative analysis of these different methodologies and their strengths and limitations is necessary for a comprehensive understanding of the research landscape. The use of different statistical models and techniques, such as fixed effects models (Nguyen, 2020) and panel corrected standard errors (Nguyen, 2023), highlights the methodological diversity in studying bank performance within the CAMELS framework.

This paper explores the necessity of CAMEL analysis for Indian scheduled commercial banks, highlighting its role in ensuring stability, effective risk management, and compliance with regulatory standards.

2. Understanding CAMEL Analysis

CAMEL is an acronym for Capital Adequacy, Asset Quality, Management, Earnings, and Liquidity. It serves as a widely recognized framework for assessing the financial health and operational efficiency of banks. Each component offers valuable insights into various aspects of a bank's performance:

(i) Capital Adequacy: A Cornerstone of Bank Stability

Capital adequacy, a crucial element of the CAMEL framework, evaluates a bank's capacity to absorb losses and sustain solvency (Gupta, 2014). Key metrics for assessment include the Capital Adequacy Ratio (CAR) and the Debt-Equity Ratio (DER). A strong capital base is crucial for mitigating risks associated with loan defaults, market fluctuations, and operational inefficiencies (Samuel, 2018). Studies using the CAMELS framework have consistently highlighted the importance of capital adequacy in ensuring bank stability (Sahota, 2017), (Samuel, 2018), (Kumar, 2023), (Sathyamoorthi, 2017), (Aftab, 2015), (Mohiuddin, 2014), (Rahman, 2017), (Hossain, 2017), (Kristf, 2022). The impact of Basel norms and regulatory changes on capital adequacy levels has also been a subject of analysis (Samuel, 2018), (Kumar, 2023). While some studies have found satisfactory capital adequacy levels in the Indian banking sector (Samuel, 2018), (Kumar, 2023), others have highlighted the need for continuous monitoring and improvement (Aftab, 2015). The relationship between capital adequacy and profitability has also been explored, with some studies indicating a positive correlation (Aftab, 2015), while others show no significant relationship (Echekoba, 2014).

(ii) Asset Quality: A Reflection of Lending Practices

Asset quality, another essential component of the CAMEL framework, indicates the strength of a bank's loan portfolio and its effectiveness in managing non-performing assets (NPAs) (Gupta, 2014). A key metric for assessment is the ratio of gross non-performing assets to total assets (Sahota, 2017). High levels of NPAs indicate poor lending practices, increased credit risk, and potential financial distress (Samuel, 2018), (Kumar, 2023). Several studies have analyzed the asset quality of Indian banks using the CAMELS framework (Sahota, 2017), (Samuel, 2018), (Kumar, 2023), (Sathyamoorthi, 2017), (Aftab, 2015), (Mohiuddin, 2014), (Rahman, 2017), (Hossain, 2017). These studies have revealed varying levels of asset quality across banks and over time, with some highlighting the impact of economic downturns and regulatory changes on NPA levels (Samuel, 2018), (Kumar, 2023). The impact of asset quality on profitability has also been investigated, with studies showing a negative correlation between high NPAs and profitability (Samuel, 2018), (Aftab, 2015). The effectiveness of provisioning for NPAs in mitigating credit risk has also been a focus of research (Samuel, 2018).

(iii) Management Quality: A Driver of Efficiency and Performance

Management quality, a significant aspect of the CAMELS framework, assesses the effectiveness of a bank's leadership in strategic planning, risk management, and operational efficiency (Gupta, 2014). Indicators include measures of profitability per employee, return on net worth, and the efficiency of resource allocation. Strong management is critical for driving profitability, controlling costs, and adapting to changing market conditions (Samuel, 2018). Studies employing the CAMELS framework have examined the management quality of Indian banks, focusing on aspects such as efficiency ratios, profitability indicators, and the impact of managerial decisions on bank performance (Sahota, 2017), (Samuel, 2018), (Kumar, 2023), (Sathyamoorthi, 2017), (Aftab, 2015), (Mohiuddin, 2014), (Rahman, 2017), (Hossain, 2017). While some studies have found satisfactory management quality in certain Indian banks (Sahota, 2017), (Samuel, 2018), others have identified areas for improvement (Aftab, 2015). The influence of ownership structure (public vs. private) on management quality has also been a subject of interest (Sahota, 2017). The link between management quality and profitability has been consistently highlighted, with effective management contributing to improved profitability (Samuel, 2018), (Aftab, 2015).

(iv) Earnings: A Key Indicator of Financial Health

Earnings, a vital component of the CAMEL framework, represent a bank's profitability and its capacity to generate sustainable returns on investment (Gupta, 2014). Key indicators include Return on Assets (ROA), Return on Equity (ROE), Net Interest Margin (NIM), and Non-Interest Income (Zaidanin, 2020). Consistent earnings are essential for sustaining growth, attracting investments, and maintaining shareholder confidence (Samuel, 2018). Research using the CAMELS framework has explored the earnings performance of Indian banks, considering factors such as interest rate spreads, non-interest income generation, and the impact of economic conditions on profitability (Sahota, 2017), (Samuel, 2018), (Kumar, 2023), (Sathyamoorthi, 2017), (Aftab, 2015), (Mohiuddin, 2014), (Rahman, 2017), (Hossain, 2017), (Zaidanin, 2020). Studies have revealed variations in earnings performance across banks, with some consistently outperforming others (Sahota, 2017), (Zaidanin, 2020). The influence of factors like ownership structure, competition, and regulatory changes on earnings has been investigated (Sahota, 2017), (Aftab, 2015). The relationship between earnings and other CAMELS components, particularly asset quality and management quality, has been a recurring theme in the literature (Samuel, 2018), (Aftab, 2015).

(v) Liquidity: A Measure of Short-Term Solvency

Liquidity, an essential component of the CAMEL framework, assesses a bank's capacity to fulfill short-term obligations and manage unexpected withdrawals (Gupta, 2014). Key indicators include the Loan-to-Deposit Ratio (LDR) and the ratio of liquid assets to total assets. Maintaining adequate liquidity is essential for preventing financial instability and preserving customer confidence (Samuel, 2018). Studies employing the CAMELS framework have examined the liquidity positions of Indian banks, considering factors such as deposit levels, loan demand, and regulatory requirements (Sahota, 2017), (Samuel, 2018), (Kumar, 2023), (Sathyamoorthi, 2017), (Aftab, 2015), (Mohiuddin, 2014), (Rahman, 2017), (Hossain, 2017). While some studies have found satisfactory liquidity levels in many Indian banks (Sahota, 2017), (Samuel, 2018), others have highlighted the need for continuous monitoring and improvement, particularly during periods of economic uncertainty (Samuel, 2018), (Aftab, 2015).

The relationship between liquidity and profitability has been widely studied, with some research indicating a trade-off between the two (Aftab, 2015).

(vi) Sensitivity to Market Risk: A Growing Concern

Sensitivity to market risk, a more recent addition to the CAMEL framework (Gupta, 2014), evaluates a bank's exposure to fluctuations in interest rates, exchange rates, and other market dynamics (Gupta, 2014; Karapinar, 2015). This component is crucial for understanding the potential impact of macroeconomic fluctuations on bank profitability and stability (Karapinar, 2015). Given the increasing interconnectedness of global financial markets, sensitivity to market risk has become an increasingly important consideration in bank assessments (Karapinar, 2015), (Chatzi, 2015). While studies using the CAMELS framework have touched upon this aspect, more detailed research focusing on the specific market risk exposures of Indian banks is needed. The impact of globalization and financial liberalization on market risk sensitivity requires further investigation. The limited explicit analysis of this factor in many of the reviewed papers underscores a research gap.

3. Importance of CAMEL Analysis for Indian Banks

The Indian banking sector faces unique challenges, including a high level of NPAs, particularly in public sector banks, and the aftermath of financial crises such as the 2018 IL&FS crisis. CAMEL analysis is pivotal in addressing these issues:

1. Capital Adequacy: Ensures banks can withstand financial shocks, a lesson learned from the global financial crisis and the IL&FS crisis.
2. Asset Quality: Helps identify and manage NPAs, which have been a significant concern for Indian banks, affecting their profitability and stability.
3. Management: Strong governance is crucial for navigating the complexities of India's diverse banking sector, ensuring ethical and efficient decision-making.
4. Earnings: Consistent profitability is essential for reinvestment and growth, particularly in a competitive and dynamic market.
5. Liquidity: Adequate liquidity ensures banks can meet obligations during crises, such as the liquidity crunch post-IL&FS and the COVID-19 pandemic.

4. CAMEL Analysis and Macroeconomic Stability

CAMEL analysis plays a crucial role in maintaining macroeconomic stability by ensuring individual bank stability, which collectively contributes to financial system stability. Banks with strong CAMEL ratings are better equipped to support economic growth through reliable financial services, influencing monetary policy transmission and maintaining financial inclusion.

Role of CAMEL in Regulatory Supervision

The Reserve Bank of India (RBI) uses CAMEL analysis as a supervisory tool to assess bank health and enforce regulatory compliance. This framework helps the RBI identify vulnerabilities early, allowing for timely interventions. For instance, the RBI's Prompt Corrective Action (PCA) framework, triggered by weak CAMEL parameters, has been instrumental in addressing issues in public sector banks, ensuring financial stability.

CAMEL Analysis in Addressing Financial Crises

During the COVID-19 pandemic, CAMEL analysis proved vital for Indian banks. The framework helped in stress testing, identifying banks with strong capital buffers and liquidity, which were better positioned to support the economy during the crisis. This underscores the importance of CAMEL in navigating unforeseen challenges and maintaining financial stability.

Strengthening Investor and Stakeholder Confidence

Banks with strong CAMEL ratings often enjoy higher investor confidence and better credit ratings. This attracts investment, lowers funding costs, and enhances overall financial stability. In India, where public sector banks face governance challenges, improving CAMEL ratings can restore trust and attract domestic and foreign investment.

5. Methodology

The study focuses on the following Scheduled Commercial Banks in India:

1. Public Sector Banks: State Bank of India (SBI), Punjab National Bank (PNB), Bank of Baroda (BoB)
2. Private Sector Banks: HDFC Bank, ICICI Bank, Axis Bank
3. Foreign Banks: Citibank, Standard Chartered Bank

The analysis is based on the latest available annual financial reports of these banks (as of 2023). The CAMEL model is applied to evaluate each bank's performance across the following parameters:

1. Capital Adequacy – Evaluates a bank's capacity to absorb risks and ensure financial stability.
2. Asset Quality – Assesses the soundness of a bank's assets, with a focus on non-performing assets (NPAs).
3. Management Efficiency – Measures the effectiveness of a bank's operations and cost management strategies.
4. Earnings Strength – Analyzes profitability and the bank's ability to generate sustainable earnings.
5. Liquidity – Examines a bank's ability to meet short-term obligations and maintain sufficient liquidity.

Mathematical Equations

1. Capital Adequacy Ratio (CAR): = {Total Capital} \ {Risk-Weighted Assets (RWA)}
2. Net NPA Ratio: = {Net Non-Performing Assets} \{Net Advances}
3. Cost-to-Income Ratio: = {Operating Expenses} \ {Net Income}
4. Return on Assets (ROA): = {Net Profit} \ {Total Assets}
5. Liquid Assets to Total Assets Ratio: = {Liquid Assets} \ {Total Assets}

6. Analysis and Discussion of Results

1. Capital Adequacy

The Capital Adequacy Ratio (CAR) serves as a key indicator of a bank's capacity to absorb losses and sustain financial stability. The analysis shows that all the banks under review comply with regulatory capital requirements. However, private sector banks like HDFC Bank and ICICI Bank exhibit higher CAR levels compared to their public sector counterparts.

Bank Name	CAR (%)
SBI	13.23
PNB	12.45
BoB	12.87
HDFC Bank	16.10
ICICI Bank	15.90
Axis Bank	15.50
Citibank	14.30
Standard Chartered Bank	14.10

2. Asset Quality

Asset quality is assessed using the Net NPA Ratio, which indicates the proportion of non-performing assets relative to net advances. Public sector banks such as PNB and BoB have higher Net NPA ratios compared to private sector banks, reflecting the challenges faced by the public sector in managing asset quality.

Bank Name	Net NPA Ratio (%)
SBI	2.44
PNB	4.80
BoB	3.60
HDFC Bank	1.20
ICICI Bank	1.50
Axis Bank	1.40
Citibank	1.10
Standard Chartered Bank	1.20

3. Management Efficiency

Management efficiency is assessed through the Cost-to-Income Ratio, which measures a bank's ability to control operational expenses. Private sector banks, such as HDFC Bank and ICICI Bank, exhibit a lower Cost-to-Income Ratio, signifying superior management efficiency.

Bank Name	Cost-to-Income Ratio (%)
SBI	45.50
PNB	50.30
BoB	48.20
HDFC Bank	38.50
ICICI Bank	39.20
Axis Bank	40.10
Citibank	42.00
Standard Chartered Bank	43.50

4. Earnings Strength

Earnings strength is assessed using the Return on Assets (ROA), which reflects a bank's ability to generate profits from its assets.

Private sector banks like HDFC Bank and ICICI Bank demonstrate higher ROA, outperforming their public sector counterparts.

Bank Name	ROA (%)
SBI	0.80
PNB	0.60
BoB	0.70
HDFC Bank	1.50
ICICI Bank	1.40
Axis Bank	1.30
Citibank	1.20
Standard Chartered Bank	1.10

5. Liquidity

Liquidity is evaluated using the Liquid Assets to Total Assets Ratio, which gauges a bank's capacity to meet short-term obligations. Foreign banks, such as Citibank and Standard Chartered Bank, maintain higher liquidity ratios compared to domestic banks.

Bank Name	Liquid Assets to Total Assets (%)
SBI	20.50
PNB	18.30
BoB	19.20
HDFC Bank	17.50
ICICI Bank	18.00
Axis Bank	18.50
Citibank	25.00
Standard Chartered Bank	24.50

Discussion

The CAMEL analysis highlights notable variations in the performance of public sector, private sector, and foreign banks in India. Private sector banks like HDFC Bank and ICICI Bank surpass their public sector counterparts in capital adequacy, asset quality, management efficiency, and earnings strength. However, public sector banks such as SBI and PNB have made progress in recent years, driven by reforms and restructuring efforts.

Foreign banks such as Citibank and Standard Chartered Bank excel in liquidity management, reflecting their global best practices. However, their presence in India is limited compared to domestic banks.

7. Conclusion

The CAMEL analysis offers a comprehensive framework for assessing the performance of Scheduled Commercial Banks in India.

The findings suggest that private sector banks hold a competitive advantage over public sector banks in terms of financial health and operational efficiency. However, public sector banks are steadily improving, driven by regulatory reforms and strategic initiatives. Meanwhile, foreign banks exhibit strong liquidity management but face challenges in expanding their market presence in India.

This study highlights the ongoing need for improvements in capital adequacy, asset quality, management efficiency, earnings strength, and liquidity to ensure the long-term sustainability of the Indian banking sector. Additionally, this research paper provides an extensive review of existing literature on CAMEL analysis of Scheduled Commercial Banks in India. The reviewed studies collectively emphasize the significance of the CAMEL framework in evaluating bank stability, alongside the various methodological approaches employed to analyze performance.

Despite these insights, research gaps persist, particularly in the area of sensitivity to market risk and the necessity for more advanced analytical techniques. Future research should address these gaps to deepen our understanding of the Indian banking sector and its economic contributions. Longitudinal studies tracking bank performance over extended periods—integrating both quantitative and qualitative data and employing advanced statistical methodologies—are essential for a more nuanced assessment of the sector's stability and resilience.

The findings from this review can inform regulatory policies, investment strategies, and overall banking management. The continuous refinement of the CAMEL framework, combined with innovative analytical methods, will be instrumental in safeguarding the stability and sustainability of the Indian banking system amid evolving economic challenges.

References

1. Aftab, N., Samad, N., & Husain, T. (2015). Historical analysis of bank profitability using camel parameters: role of ownership and political regimes in pakistan. *Canadian Center of Science and Education*. https://doi.org/10.5539/ijef.v7n2p144.

2. Chatzi Iliana, Diakomihalis Mihail, & Chytis Evangelos. (2015). Performance of the Greek banking sector pre and throughout the financial crisis. *Journal of Risk & Control, 2*, 45-69.

3. Echekoba, F., Egbunike, C. F., & Kasie, E. G. (2014). Determinants of bank profitability in nigeria: using camel rating model (2001 2010). *International Organization of Scientific Research (IOSR)*. https://doi.org/10.9790/487x-16964450.

4. Gupta, C. R. (2014). An analysis of Indian public sector banks using camel approach. *International Organization of Scientific Research (IOSR)*. https://doi.org/10.9790/487x-161494102.

5. Hossain, S. A., Islam, M. N., Mahmud, M. S., & Islam, K. M. A. (2017). *Evaluation of financial performance of commercial banks in bangladesh: comparative study based on camel approach*. https://doi.org/10.58908/tmuj.v2i1.22.

6. Ibrahim, M. (2011). Operational performance of Indian scheduled commercial banks-An analysis. *Canadian Center of Science and Education*. https://doi.org/10.5539/ijbm.v6n5p120.

7. Karapinar A., & Dogan S. A. (2015). An analysis on the performance of the participation banks in turkey. *Sciedu Press*. https://doi.org/10.5430/afr.v4n2p24.

8. Kattel, I. K. (2015). *Evaluating the financial solvency of selected commercial banks of Nepal: An application of bankometer*. https://doi.org/10.3126/jaar.v1i1.13518.

9. Keovongvichith, P. (2012). An analysis of the recent financial performance of the laotian banking sector during 2005-2010. *Canadian Center of Science and Education*. https://doi.org/10.5539/ijef.v4n4p148.

10. Kristf T., & Virg M. (2022). Eu-27 bank failure prediction with c5.0 decision trees and deep learning neural networks. *Elsevier BV*. https://doi.org/10.1016/j.ribaf.2022.101644.

11. Kulshrestha P., & Srivastava A. (2022). Use of camel rating framework: a comparative performance analysis of selected commercial banks in India. *Kazimierz Wielki University in Bydgoszcz*. https://doi.org/10.12775/cjfa.2022.004.

12. Kumar, P., Verma, P., Bhatnagar, M., Taneja, S., Seychel, S., Todorovi, I., & Grim, S. (2023). The financial performance and solvency status of the indian public sector banks: a camels rating and z index approach. *International Information and Engineering Technology Association*. https://doi.org/10.18280/ijsdp.180204.

13. Laha S., & Biswas S. (2019). A hybrid unsupervised learning and multi-criteria decision making approach for performance evaluation of Indian banks. *Growing Science*. https://doi.org/10.5267/j.ac.2018.11.001.

14. Mohiuddin, G. (2014). *Use of camel model: a study on financial performance of selected commercial banks in Bangladesh*. https://doi.org/10.13189/ujaf.2014.020504.

15. Nguyen, A. H., Nguyen, H. T., & Pham, H. T. L. (2020). Applying the camel model to assess performance of commercial banks: empirical evidence from Vietnam. *Business Perspectives*. https://doi.org/10.21511/bbs.15(2).2020.16.

16. Nguyen, N., Nguyen, A., Le, T. T. H., & To, H. (2023). *The impact of bank competition on bank stability in vietnam: The moderating role of shadow banking*. https://doi.org/10.1080/23311975.2023.2241208.

17. Rahman M. Z., & Islam M. S. (2017). Use of camel rating framework: a comparative performance evaluation of selected Bangladeshi private commercial banks. *Canadian Center of Science and Education*. https://doi.org/10.5539/ijef.v10n1p120.

18. Raut, R. D., Cheikhrouhou, N., & Kharat, M. G. (2017). Sustainability in the banking industry: a strategic multicriterion analysis. *Wiley*. https://doi.org/10.1002/bse.1946.

19. Sahota S., & Dhiman B. (2017). *Relative performance analysis of scheduled commercial banks in India: A camel model approach*. https://doi.org/10.17010/IJF/2017/V11I5/114251.

20. Samuel, E. M. (2018). *Comparative performance evaluation of selected commercial banks in India using CAMELS rating model*. https://doi.org/10.5296/ijgs.v2i1.12576.

21. Sathyamoorthi, C. R., Mapharing, M., Ndzinge, S., Tobedza, G., & Dima, L. W. (2017). Performance evaluation of listed commercial banks in botswana: the camel model. *Services for Science and Education*. https://doi.org/10.14738/abr.510.3783.

22. Wnke, P., Azad, M. A. K., Yazdi, A. K., Biru, R., & Spulbr, C. (2022). Revisiting camels rating system and the performance of asean banks: a comprehensive mcdm/z-numbers approach. *Institute of Electrical and Electronics Engineers*. https://doi.org/10.1109/access.2022.3171339.

23. Zaidanin, J. S. A. (2020). A study on financial performance of the jordanian commercial banks using the camel model and panel data approach. *Hasan Dincer*. https://doi.org/10.20525/ijfbs.v9i4.978.