Do CAMEL Indicators Contribute Towards Profitability of Islamic Banks?

Naairah Hanif

Bahauddin Zakariya University, Multan, Pakistan

Abstract

This paper evaluates the effect of bank-specific variables in terms of Capital Adequacy (C), Asset quality (A), Management (M), Earnings (E) and Liquidity (L) commonly known as CAMEL approach, across bank profitability of Islamic banks from six Islamic countries namely; Brunei Darussalam, Indonesia, Kuwait, Oman, Pakistan and UAE over a period of 4 years (2014-2017) based on a quarterly data. The data on CAMEL variables has been collected on aggregate basis for Islamic banks from six of the Islamic countries. The study makes use of a panel data regression analysis. Results of the study state that the profitability of Islamic banks is positively influenced by the 'MEL' part of the CAMEL rating system namely: Management, Earnings and Liquidity, along with bank size and inflation. The study is expected to be useful both for policy makers, as well as the executives of Islamic banks across the globe. It is expected to contribute as to which factors determine the effect of CAMEL indicators across profitability of banks globally.

Keywords: CAMEL, Profitability, Panel Data Analysis, Islamic banks.

1. Introduction

Banks tend to play a significant role in improving a country's resource mobilization. Islamic banks are emerging and have become more widespread by providing a workable financial substitute to the world economic system. Hence, it is imperative that we measure Islamic banks' performance to ensure a strong financial system and a competent economy. Evaluating banking sector performance is important since the banks are an important channel for resource mobilization in an economy. The banks are an exposed to numerous risks which are emerging to be more complex these days (Sundararajan et al., 2002).

Several factors play a major role in evaluating banks' performance around the globe. Analysis through financial ratios, gauging performance against the budget, benchmarking or a combination of such methods is normally used for the performance evaluation of financial institutions and banks (Avkiran, 1994).

Corresponding Author: Naariah Hanif, e-mail: naairah16@gmail.com

Alam (2013) perceives the bank regulations as the frameworks used to monitor operations, creations and liquidation of banks in an economy. Banks require a technique to assess their performance and contemplate the important financial ratios to measure their weaknesses and strengths.

The most recent technique used for measuring bank performance has been the CAMEL approach. The 'CAMEL' is a supervisory rating system established in the United States in the years 1979-80 to rate the overall performance of a bank. It is functional across every credit union and bank in the US and executed outside the US by numerous banking supervisory regulators (Rahman & Majumder, 2017). CAMEL approach is practiced by the banks' administration to measure its financial performance and health (Rozanni & Rahman, 2013). It is mainly a model based on ratio methods for examining the banks' performance (Dang, 2011). It consists of five components: capital adequacy, asset quality, management, earnings and liquidity.

The present empirical investigation examines the performance of Islamic banks across six Islamic countries namely; Brunei Darussalam, Indonesia, Kuwait, Oman, Pakistan and UAE. The performance is compared over a period of 2014-2017 by using a quarterly data. Choice of countries along with period of analysis was guided by the access to data and its availability. To the best of information extracted by the authors, this study stands as the pioneer in measuring Islamic banks' performance using CAMEL approach in a multi-country analysis context.

The study on profitability of Islamic banks is important for two reasons. Firstly, Islamic banks, being in competition with their conventional counterparts, need to be profitable both for survival and growth reasons. Secondly, these banks need to be profitable to attract customers from their conventional counterparts.

Findings of the study disclose that profitability of Islamic banks was positively associated with three variables of CAMEL rating system namely: Management, Earnings and Liquidity, along with the two control variables i.e. bank size and inflation. This alludes to the fact that Islamic banks are performing well in terms of their management, meeting of their financial obligations and management of their earnings. The study makes an important contribution to literature through some managerial implications for managers of Islamic banks and policy makers, too. The findings reveal that the banks need to be consistent in maintaining their profitability levels through availing the economies of scale and scope. Likewise, it also suggests that better liquidity management profile can help to control the liquidity risk.

The discussion that follows is organized as follows. Section 2 provides a reflection on the extant literature while section 3 is devoted to methodology. The results are discussed in section 4 while the final part concludes with implications and an agenda for future research.

2. Literature Review

Numerous studies have been conducted on the issue under discussion. According to Kumar & Sayani (2015), the CAMEL approach is extensively used by the administrative bodies around the world to rate the financial status of banking institutions and to help in identifying which capital or alternative arrangements banks need to continue their operations. Given the context, the significance of CAMEL cannot be ignored. Although, countless studies do exist on the contribution of CAMEL towards bank performance, yet the role of CAMEL towards Islamic banks' performance needs to be explored through the lens of a broader sample of Islamic banks across the globe.

Khan et al. (2018) examined the performance of five Islamic banks vis-à-vis conventional banks in Pakistan, using the variables: capital, efficiency, liquidity, profitability and risk. Data were obtained through interviews from the bank managers and the banks' annual reports for the period 2006 to 2015. Some of these included ROA, ROE, debt to equity ratio, current ratio, capital ratio and operating efficiency ratio. Performance by both categories of the banks was compared by using t-tests. As per their findings, performance of conventional banks was better in terms of profitability and efficiency while being riskier than their Islamic counterparts. However, they were lagging behind their Shariah counterparts in the area of liquidity even with the same levels of capital.

A study carried out by Shaddady & Moore (2018) used the CAMELS-DEA method to evaluate the impact of financial supervision and regulation on bank stability across 47 countries in Europe including 2210 banks over the time period of 2000-2016. The dependent variables included the CAMELS indicators representing the financial stability and the independent variables included the Activity restrictions, Business freedom index, Capital regulation index, Core Profitability Model, Deposit Insurance, Governance index, Government-owned banks, GDP, Inflation, Herfindahl Hirschman Index (HHI) and Private monitoring index. Data were collected from various databases and indexes along with the authors' calculation. Analysis was done through quantile regression and the DEA technique. Results revealed that higher capital regulation was positively related to bank stability, whereas narrow restrictions, inflation, deposit insurance and too much supervision had an adverse impact on

bank stability. Furthermore, it was revealed that smaller banks, banks of emerging countries and commercial banks were comparatively sensitive to regulatory shocks.

Tanveer et al. (2018) developed a Financial Performance Index (FPI) based on CAMEL to study banks performance. Financial, bank-specific and macroeconomic indicators, were used as independent variables while FPI was used as the dependent variable. Financial variables included financial freedom, market capitalization and market concentration, bank-specific variables included bank size, reserves, deposits, profitability, operating efficiency and overheads and finally the macro-economic variables consisted of GDP, the real interest rate and political instability. Data of these was collected from different databases. The CAMEL indicators were calculated using separate ratios and all the data were attained from the SBP. For the analysis, fixed and random effects regression tests were used and the Hausman test was applied for the suitability of model between fixed and random effects. They found that management quality, earnings, liquidity, sensitivity, overheads, reserves and size were significantly affecting the FPI whereas the rest of the variables revealed an insignificant impact.

Khasharmeh (2018) carried out a study in Bahrain to observe how liquidity affects profitability of Islamic Banks for the time period 2010 to 2015. Profitability, calculated through ROA, ROD and ROE was used as the dependent variable and liquidity (measured through the cash & due from banks over total assets and over total deposits separately, investment (loans and advances) over total assets and over total deposits separately) was taken as the independent variable. Pearson correlation test was used for all the variables and regression analysis was used for the profitability ratios to get the results. Overall, it was revealed that liquidity had a strong influence on Islamic banks, profitability in Bahrain.

In a study conducted by Ahsan (2016), CAMEL model was used to evaluate performance of three Islamic banks in Bangladesh for the period 2007-2014. Six ratios were used to calculate the CAMEL indicators, they were: capital adequacy which was measured using equity divided by the assets, investment loss reserve was used to calculate asset quality, quality of management was measured by dividing the cost by income, earnings were measured by net profit over total assets and net profit divided by the total equity and finally, liquidity measured by net loans to total assets. The CAMEL ratings were then assigned 5 categories with specific ranges as: Strong (1.00-1.49), Satisfactory (1.50-2.49), Fair (2.50-3.49), Marginal (3.50-4.49) and Unsatisfactory (4.50-5.00). Results

revealed that the financial performance of the selected banks was strong under every aspect.

Rostami (2015) investigated the impact of each of the category of CAMELS on bank performance in Iran using the Tobin's Q ratio as an indicator of performance. Data were obtained from the bank's written archives over the period of 2005-2014. Performance of bank was considered to be the dependent variable presented with Tobin's Q ratio while the CAMELS indicators were used as the independent variables with 5 ratios to measure each variable. The results indicated that there existed a substantial relation among each category of the CAMELS model and bank performance ratio.

Alam (2013) studied the effect of banking regulations on efficiency and the risks involved in Islamic banking using the DEA model. Bank cost inefficiency and bank risks were taken as dependent variables and three kinds of variables were used as independent variables: regulatory, country and bank specific. Regulatory consisted of; Supervisory Power, Capital Requirements, Private Monitoring and Restrictions on banks' activities. The bank specific variables included; loan-loss reserves, net loans divided by the total assets, total assets, liquid assets over short term deposits and yearly dummy variables for 2006-2010. Finally, country-specific variables included; ratios of liquid assets to total assets, operating expenses to total assets, loan-loss provisions over total loans and growth of real GDP. Results revealed that strict monitoring and regulations of bank operations and advanced supervisory control of the management, led to an increased technical efficiency, but reduced risk taking of Islamic banks.

Misra & Aspal (2013) carried out a research on financial soundness and performance of six commercial banks in India using the CAMEL rating system. They used a number of ratios to measure each component of CAMEL approach. According to their findings, the banks had obtained diverse ranks under the CAMEL ratios, but statistically there was no substantial difference among the CAMEL ratios as the performance of all banks was overall the same.

Tanko & Wirnkar (2008) examined the application of CAMEL approach in measuring bank performance in Nigeria. They collected the data from financial reports of 11 banks in Nigeria for a 9 years' time period. Efficiency was calculated using DEA where the number of employees, fixed assets and deposits were taken as inputs and operating income, deposits and loans were taken as outputs and these specifications were defined as inputs mapping to outputs. Next, T-test equations were used to measure the CAMEL indicators with individual ratios to measure each variable. From the results, they identified the best ratio of each factor and found out that no single variable in the CAMEL method is enough to represent how a bank is performing overall.

In context of the literature above, it can be noticed that the extant literature on bank performance and CAMEL indicators reveals mixed findings and is restricted to individual countries based on annual data series, limited variables, single performance indicators or simple financial ratios in most cases. Hence, there emerges a need to study the relationship between profitability of Islamic banks and CAMEL indicators in a multi-country setting through the use of more recent data based on quarterly series.

3. Research Methodology

3.1. Description of Variables

The study uses a time period of four years from 2014-2017 based on a quarterly data with 96 observations. Islamic banks' performance is gauged through regression analysis which estimates the impact of CAMEL across profitability (ROE) of banks in the sample. The study also uses control variables like bank size and inflation with bank profitability as the dependent variable. The model proposed for the analysis of bank performance is as under

$$Profitbility = f\{CA, AQ, MANG, EARN, LIQ, BS, INF\} \quad Eq-1$$

A brief description of the variables is discussed as under while their measurement is shown in Table 1.

3.1.1. Profitability in business organizations is the ability to maintain profits on a yearly basis. Performance of banks in profitability context means the success of management which is the key performance indicator for investors (Menicucci & Paolucci, 2016) and is measured using the return on equity (ROE).

3.1.2. Capital Adequacy is the size of capital that is anticipated to preserve steadiness between risks exposed to financial institutions e.g. operational risk, credit risk, liquidity risk and market risk etc., so as to eliminate the possible losses and protect the debt holder (Dang, 2011). It is measured through the capital adequacy ratio.

3.1.3. Asset Quality specifies the type of loans generated by banks to produce earnings and their borrowers, being assets of the banks. When high rated companies are given advances, their rates are less attractive in comparison to the rates of poorly rated, doubtful companies (Reddy, 2012). The gross non-performing financing ratio is used to measure the asset quality of loans.

3.1.4. Management represents how efficient and effective the performance of the bank management is It basically means the observance of setting rules, the ability to plan, respond to fluctuating situations, leadership activities and the

managerial competence of banks (Misra & Aspal, 2012). The ratio of cost to income is used to represent management quality.

3.1.5. Earnings are important to gauge the monetary performance of institutions. Earning quality assesses the effectiveness and efficiency of a bank and explicates the sustainability and growth of future earnings (Ahsan, 2016). Return on assets (ROA) is used as a proxy for earnings in the current study.

3.1.6. Liquidity determines whether or not banks are able to meet their financial obligations. A liquidity position is acceptable when an organization can attain enough liquid funds, either through the increase in its liabilities or by the rapid conversion of its assets into cash (Majumder & Rahman, 2017). This has been measured by the liquid assets ratio.

3.1.7. Bank size is an indicator of the amount of total assets each bank holds. It is measured by total assets of the banks. The bank size is important in terms of scale of operations as larger banks are able to generate higher income levels due to scale economies as compared to their smaller counterparts.

3.1.8. Inflation is a significant variable to measure the bank performance as borrowing and lending rates are affected by rates of inflation in an economy. Higher rates of inflation are accompanied by higher interest rates on loans leading to higher income (Tan & Floros, 2012). Although the CPI is considered to be one of the most appropriate inflation measures, the index calculated is only based on prices already existing in the index. The basket used in CPI is static and sometimes misses prices changes outside of the basket of goods. This makes the GDP deflator a better indicator of inflation (Chen, 2019).

3.2. Data and Sample Selection

The study makes use of quarterly panel data for six countries and four years, 2014-2017. Bank-specific data for the research has been taken from Islamic financial services board (IFSB) database which is a comprehensive database on Islamic banks across the globe while the data for inflation was extracted from World Development Indicators (WDI) of the World Bank.

3.3. Description of Variables

The variables used are explained in Table-1 below and the estimated equation is as follows:

$$ROE_{it} = \beta_o + \beta_1 CA_{it} + \beta_2 AQ_{it} + \beta_3 MANG_{it} + \beta_4 EARN_{it} + \beta_5 LIQ_{it} + \beta_6 BS_{it} + \beta_7 INF_{it} + \varepsilon_{it} - Eq - 2$$

Table 1: Description of variables used in the study with measurement and their expected signs

Variables	Symbols	Definitions
		Dependent variable
Profitability	ROE	Net income (before extraordinary items, taxes, and Zakat)/ shareholder equity
		Independent variables
Capital Adequacy	CA	Total regulatory capital/risk weighted assets
Asset Quality	AQ	Ratio of gross non-performing financing to total financing
Management	MANG	Operating cost / gross income
Earnings	EARN	Net income (before extraordinary items, taxes, and Zakat) / total assets
Liquidity	LIQ	Liquid assets / total assets
Bank Size	BS	Log of total assets of the banks.
Inflation	INF	Inflation rate measured by the GDP deflator.

4. Discussion of Results

Before discussion of results, the descriptive statistics followed by correlation analyses among variables, are presented below.

Table 2: Descriptive Statistics

	BS	AQ	CA	EARN	INF	LIQ	MANG	ROE
Mean	5.20	0.05	0.21	0.01	0.58	0.27	0.77	0.09
Median	5.51	0.05	0.17	0.01	0.51	0.25	0.70	0.11
Maximum	6.13	0.11	0.78	0.03	2.65	0.61	2.77	0.23
Minimum	3.93	0.00	0.13	-0.05	-1.30	0.06	0.18	-0.07
Std. Dev.	0.75	0.03	0.12	0.01	0.72	0.15	0.48	0.07
Skewness	-0.55	-0.26	3.34	-2.38	0.35	0.55	2.40	-0.98
Kurtosis	1.74	2.38	14.26	8.65	3.32	2.06	9.95	3.35
Jarque-Bera	11.23	2.60	686.09	218.20	2.42	8.31	285.45	15.89
Probability	0.00	0.27	0.00	0.00	0.30	0.02	0.00	0.00
Obs.	96	96	96	96	96	96	96	96

Table 3: Correlation matrix of the variables used in the analysis

	BS	AQ	CA	EARN	INF	LIQ	MANG	ROE
BS	1.00							
AQ	-0.02	1.00						
CA	0.02	-0.55	1.00					
EARN	-0.34	0.65	-0.88	1.00				
INF	0.29	0.14	-0.28	0.11	1.00			
LIQ	-0.68	0.08	0.24	0.10	-0.28	1.00		
MANG	0.49	-0.45	0.82	-0.93	-0.02	-0.17	1.00	
ROE	-0.17	0.72	-0.72	0.86	0.18	0.24	-0.71	1.00

4.1. Descriptive Statistics and Correlation Analysis

Descriptive statistics are the coefficients which outline a specific data set either be a description of the entire population or a sample of it. Descriptive statistics are divided into measures of dispersion and central tendency. The measures of dispersion represent standard deviation, maximum and minimum while the central tendency measures include mean, median and mode. Before conducting the intended analyses, descriptive statistics were checked to test for the normalization of data and are reflected in Table 2. Correlation represents the strength of a relationship across different variables and its nature in terms of positivity or negativity. Table 3 below shows the results of correlation among variables used in the study.

Results of the regression analysis are reflected in Table 4 below where asset quality (AQ) and capital adequacy (CA) emerge with a positive but insignificant relationship with the dependent variable.

The existence of an insignificant relationship of capital adequacy with profitability of banks reflects that banks might not have a reasonable margin to absorb a substantial volume of losses before they become bankrupt and thus lose depositors' funds. Furthermore, the insignificance of the asset quality variable might be due to the fact that Islamic Banks might not be differentiating between high quality and subprime loans since these loans tend to be backed by assets. This feature of Islamic banking reduces their exposure to the risk of default as noticed during the financial crisis of 2007 and 2008. The findings are in line with those by Tanveer et al. (2018) where a weak and insignificant relationship was discovered across CA and AQ with bank performance.

Table 4: Panel Least Squares Estimates of Bank Profitability

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	−0.226930	0.038689	−5.865526	0.0000
AQ	0.110317	0.143665	0.767875	0.4446
CA	0.046422	0.072332	0.641792	0.5227
BS	0.034578	0.006238	5.542841	0.0000
EARN	5.729209	0.692590	8.272148	0.0000
LIQ	0.190191	0.025792	7.374074	0.0000
MANG	0.038538	0.019686	1.957691	0.0534
NF	0.006811	0.003745	1.818699	0.0724
R-squared	0.893393			
Adjusted R-squared	0.884913			
S.E. of regression	0.023207			
Log likelihood	229.2346			
F-statistic	105.3522			
Prob(F-statistic)	0 000000			

Bank Size (BS) reveals a positive and significant relationship with bank profitability. This reveals that increase in assets of Islamic banks, improves their overall performance hence, making them more profitable. This may be for the reason that larger banks tend to flourish compared to their smaller counterparts in achieving a higher ROE. Furthermore, an increase in size of the assets may lead to lesser costs. Finally, as the banking operations expand, more opportunities emerge for an increase in profitability of banks resulting from economies of scale and scope. The same is supported by the findings of Tanveer et al. (2018) and Menicucci & Paolucci (2016).

Earnings (EARN) appear with a positively significant relationship with bank profitability. This result is as per our expectations as earnings are important for a bank and need to be high in order for a bank to perform well. This also means that Islamic banks are generating sufficiently good amount of earnings which is leading to sustainability and growth of future earnings. This augurs well about Islamic banking performance as compared to their conventional counterparts which are bigger in scale and size. These findings are consistent with those of Tanveer et al. (2018) and Rostami (2015).

Liquidity (LIQ) of Islamic banks surfaced as positively significant with bank profitability which is a good sign to divulge that Islamic banks can fulfill their financial obligations ergo, increasing profitability of banks. The availability of an adequate amount of liquidity helps these banks to avoid the risk of default

on their obligations to their customers, strengthening their confidence further. The finding is similar to those by Khasharmeh (2018), Tanveer et al. (2018) and Rozzani & Rahman (2013).

Management (MANG), as mentioned before, indicates how efficiently and effectively the managers of a bank are performing. The result is positively significant which discloses that better performance by the management leads to an increase in profitability of Islamic banks. The management is performing well by keeping their income high while costs on the lower side. This might have been happening through the efficiency drive by such bank where maximum output is being achieved through the given levels of inputs. These results are consistent with the findings by Rozzani & Rahman (2013) and Tanveer et al. (2018).

Inflation (INF) variable, being a macroeconomic phenomenon, is significant and positively associated with ROE. This could be for the reason that the levels of inflation were completely anticipated by Islamic banks throughout the period of our study, giving them a chance to adjust their benchmarks accordingly and thus, to earn greater profits. During the periods of rising levels of inflation, revenues increase faster than costs which assist the banks towards their profit motive. This result is in line with those of Tan & Floros (2012) and Tan (2016) for Chinese banks and Pasiouras & Kosmidou (2007) for the European banks.

5. Conclusion

The study contributes to literature on performance of Islamic banks through an empirical evidence for the first time in terms of association between bank profitability as well as the bank and country specific variables. The sample comprised of a panel data set of Islamic banks operational in six of the Islamic countries that are believed to be the largest sponsors towards the progression of Islamic banking. Our findings indicate that ROE of Islamic banks was affected in a positive way by 'MEL' part of the CAMEL rating system namely, Management, Earnings and Liquidity. Moreover, findings of the study reveal a positive impact of bank size and inflation variables on profitability of Islamic banks. It is important to observe the existence of a strong relationship across bank profitability and the aforementioned variables. It can also be concluded from the results that Islamic banks are performing well in terms of their management performance, meeting their financial obligations and earning management. Furthermore, capital adequacy and asset quality reveal insignificant impacts on profitability of Islamic banks. This alludes to the fact that Islamic banks are facing issues of preserving their capital in order to

maintain their stability towards the risk exposure while they need to improve the quality of their assets too.

The study offers some useful implications both on policy and managerial fronts. Firstly, the banks need to be consistent in maintaining their profitability levels through availing the economies of scale and scope due to size. Secondly, Islamic banks appear to be in control of liquidity risk through better liquidity management profile. This might be due to the inherent feature of Islamic banks in following an asset-based and asset-backed banking system. Thirdly, the asset utilization feature of Islamic banks as reflected by the better earning management practices needs to be augmented and sustained. Finally, Islamic banks appeared to be good at foreseeing about the levels of inflation giving them a chance to adjust their benchmarks accordingly, a practice that needs to be upheld in future, too.

The biggest challenge faced in this study was the limited availability of consistent data throughout the quarters since the study is limited to Islamic banks only, leading to a limited sample for the analyses. Further investigation may be conducted to test for the consistency of our findings through a rather illustrative sample of both non-Islamic and Islamic banks worldwide. Future research can also be directed towards the use of alternative bank-specific indicators such as leverage, sensitivity to risk, number of ATMS, number of employees, etc. and country-specific variables like GDP, financial development, political instability, etc. Furthermore, performance of Islamic banks could also be evaluated through the lens of technical efficiency, stability and market power indicators. However, these can be an agenda for future research.

References

Ahsan, M. K. (2016). Measuring financial performance based on CAMEL: A study on selected Islamic banks in Bangladesh. *Asian Business Review*, *6*(1), 47-56.

Alam, N. (2013). Impact of banking regulation on risk and efficiency in Islamic banking. *Journal of Financial Reporting and Accounting*, *11*(1), 29-50.

Avkiran, K. N. (1994). Developing an instrument to measure customer service quality in branch banking. *International journal of bank marketing*, *12*(6), 10-18.

Chen, J. (2019, March 12). GDP Price Deflator. Retrieved from https://www.investopedia.com/terms/g/gdppricedeflator.asp

Dang, U. (2011). The CAMEL rating system in banking supervision. A case study.

Islamic Financial Services Board (2018) Database, https://www.ifsb.org/psifi_03.php

Khan, T., Ahmad, W., Rahman, M. K. U., & Haleem, F. (2018). An Investigation of the Performance of Islamic and Interest Based Banking Evidence from Pakistan. *HOLISTICA–Journal of Business and Public Administration*, *9*(1), 81-112.

Khasharmeh, H. (2018). Does Liquidity Influence Profitability in Islamic Banks of Bahrain: An Empirical Study?. *International Journal of Financial Research*, *9*(2), 236.

Kumar, V., & Sayani, H. (2015). Application of CAMEL model on the GCC Islamic banks 2008-2014. *Journal of Islamic Banking and Finance*, *3*(2), 1-14.

Majumder, M. T., & Rahman, M. M. (2017). A CAMEL Model Analysis of Selected Banks in Bangladesh.

Menicucci, E., & Paolucci, G. (2016). The determinants of bank profitability: empirical evidence from European banking sector. *Journal of Financial Reporting and Accounting*, *14*(1), 86-115.

Misra, S. K., & Aspal, P. K. (2012). A CAMEL Model Analysis of State Bank Group. *World Journal of Social Sciences, 3*(4), 36-55. doi:10.2139/ssrn.2177081

Moore, T., & Shaddady, A. (2018). Investigation of the effects of financial regulation and supervision on bank stability: The application of CAMELS-DEA to quantile regressions.

Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, *21*(2), 222-237.

Reddy, S. K. (2012). Relative performance of commercial banks in India using CAMEL approach. *International Journal of Multidisciplinary Research*, *2*(3), 38-58.

Rostami, M. (2015). Determination of Camels model on bank's performance. *International Journal of Multidisciplinary Research and Development*, *2*(10), 652-664.

Rozzani, N., & Rahman, R. A. (2013). Camels and performance evaluation of banks in Malaysia: conventional versus Islamic. *Journal of Islamic Finance and Business Research*, *2*(1), 36-45.

Sundararajan, V., Enoch, C., San Jose, A., Hilbers, P., Krueger, R., Moretti, M., & Slack, G. (2002). *Financial soundness indicators: analytical aspects and country practices*(Vol. 212). Washington, DC: International Monetary Fund.

Tan, Y. (2016). The impacts of risk and competition on bank profitability in China. *Journal of International Financial Markets, Institutions and Money*, *40*, 85-110.

Tan, Y., & Floros, C. (2012). Bank profitability and inflation: the case of China. *Journal of Economic Studies*, *39*(6), 675-696.

Tanveer, S., Bhatti, W. K., Shafi, K., & Shahzad, F. (2018). Examining the financial performance of banks using camel approach. Management, 1(1), 2-2.

Wirnkar, A. D., & Tanko, M. (2008). CAMELS and banks performance evaluation: The way forward. Available at SSRN, 1150968.

World Bank (2018) World Development Indicators, World Bank Database.