An Empirical Investigation of Banking Sector Performance of Pakistan by Using CAMELS Ratio of Framework

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Abstract

This study has been initiated to achieve the objective that is; "to evaluate the impact of CAMELS Ratio on performance of banking sector in terms of Efficiency by using regression model". CAMELS ratio has been used because it is internationally accepted bank performance measuring tool that evaluates the overall financial health of banks by identifying financial, managerial and operational strength and weaknesses of the bank. 'CAMELS' is an abbreviation of; Capital, Assets, Management, Earning, Liquidity and Sensitivity to market risk. We have evaluated the performance of the 15 banks which are listed at Karachi Stock Exchange for data between 200-2012. Both Fixed and random effects models were estimated. Empirical results of study CAMELS evaluation and analyses results for the Pakistani sample banks revealed that almost all large banks are placed at the top that shows better performance and efficiency in the banking industry as compared to the small banks that were lagging behind. The results of the Generalized Least Square (GLS) method based on CAMELS ratios has shown that asset quality, Earning and liquidity have significant predictability.

Keywords: CAMELS, Banks performance, Efficiency Ratio, Regression, Banking industry, Pakistan.

Introduction

A sound and progressive financial sector is essential to support economic growth of a country. According to SBP, *"as growth in the banking sector and the real economy mutually strengthen each other"*. The banking sector constitutes the core of the financial sector in Pakistan. The aim and objective of this research study is to access the performance and efficiency of the banking sector in

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Pakistan by using CAMELS ratio. This framework was firstly known under the name of CAMEL. The Uniform Financial Institutions Rating System (UFIRS) was adopted by the Federal Financial Institutions Examination Council (FFIEC), USA on November 13, 1979. Under the 1997 revision of the UFIRS, each financial institution is assigned a composite rating based on an assessment and rating of six essential components of an institution's financial condition and operations that are summarized in a composite "CAMELS" rating. The acronym CAMELS stands for Capital Adequacy, Asset Quality, Management, Earnings, Liquidity, and Sensitivity to Market Risk. Composite and component ratings are assigned based on a 1 to 5 numerical scale. The rating 1 indicates the highest rating, strongest performance and risk management practices, and least degree of supervisory concern, while the rating 5 indicates the lowest rating, weakest performance, inadequate risk management practices and therefore, the highest degree of supervisory concern (Federal Deposit Insurance Corporation, 1997).

During the great depression of the 1940s, the stream of bank failures experienced in the USA encouraged considerable awareness to bank performance and this consideration has been grown constantly since then. In 1979, USA federal regulators developed the CAMELS rating system, with framework for rating financial position and individually banks performance. Due to the recent global financial crises of 2007–2008, both national and international economies recognized the importance of banks performance and need to keep it under supervision.

Therefore, in this study the GLS method has been employed on CAMELS ratio to measure the efficiency of selected commercial banks. The research paper is organized as follows: part two elaborates the review of the relevant literature on the subject, part three is dedicated to the data and the methodology used, part four covers the analysis and discussion of the selected banks and part five concludes the study.

Literature Review

The role of public sector banks and other financial institutions in economic development had been examined in many studies. There were two broad views about government involvement in financial systems around the world, i.e; 'development' view and 'political' view. The development view as analyzed by Gerschenkron (1962) stated that governments could intervene through their financial institutions to direct savings of the people towards developmental

sectors in countries where financial institutions were not adequately developed to channel resources into productive sectors.

Contrary to this view, in recent years a new 'political' view of government ownership had evolved which asserts that state control of finance through banks and other institutions politicizes resource allocation for the sake of getting votes or bribes for office holders and thereby results in lower economic efficiency.

Cole and Gunther (1998) had made a study on—A CAMEL Rating's Shelf Life and their findings suggested that, if a bank had not been examined for more than two quarters, off-site monitoring systems usually provide a more accurate indication of survivability than its CAMEL rating. Barr et al. (1999) provided evidence that a shift in investors' focus from earnings information to book values was noticeable for firms weakening in financial health. Mohan and Ray (2004)examined a comparison of performance among three categories of banks that was public, private and foreign banks by using physical quantities of inputs and outputs. Also comparing the revenue maximization efficiency of banks during 1992-2000. The findings showed that PSBs performed significantly better than private sector banks but not differently from foreign banks. The conclusion pointed to a junction in performance between public and private sector banks in the post-reform era.

Khalid (2006) examined "The Effect of Privatization and Liberalization Banking Sector Performance in Pakistan". He employed the CAMELS framework on performance of banking sector between the periods 1990-2002 in Pakistan. The performance of the privatized banks had been less than satisfactory as compared to public banks.

Athanasoglou et al. (2006) examined the profitability behavior of bank-specific, industry related and macroeconomic determinants, by using an unbalanced panel data of South Eastern European (SEE) credit institutions over the period 1998-2002. The estimation results indicated that with the exception of liquidity, all bank-specific determinants significantly affect bank profitability in estimated way but positive relationship between banking reform and profitability was not identified.

Wu, Chen and Shiu (2007) investigated the impact of financial development and bank characteristics which included operational performance of commercial banks in Chinese transitional economy. They employed Pooled data on 14 Chinese banks during 1996-2004 using. Fixed and random effects models Empirical results

exhibited higher levels of moneterization that could translate into better ROA. The longer a bank had been in existence, the worse its ROA performance was found to be. Rather than leading to improved profitability, The ROA performance of larger Chinese banks was found to be lower to that of the smaller shareholding commercial banks.

Chotigeat (2008) assessed the efficiency of domestic and foreign banks in Thailand since Asian financial crisis. Using quarterly time-series data of domestic and foreign banks from 1997 to 2003, he analyzed the cause of their efficiency. His findings indicated that both the loan loss provisions and efficiency ratio had negatively influenced the performance of domestic banks, while only loan loss provisions had influenced the negative performance of foreign banks. Wirnkar and Tanko (2008) analyzed the "CAMEL(S) and Banks Performance Evaluation". They found that CAMEL captured overall performance of a bank using secondary data collected from the annual reports of 11 commercial banks in Nigeria over a period of (1997–2005) . Data was analyzed by the Efficiency Measurement System (EMS) and independent T-test equation. The findings had exposed the inability of each factor in CAMEL to capture the holistic performance of a bank and the relative weight of importance of the factors in CAMEL resulting change in acronym of CAMEL to CLEAM.

Atkogullari (2009) employed a similar approach based on CAMEL framework to analyze the performances of the Northern Cyprus banking sector. The results suggested that the profitability and the management quality of the analyzed banks had improved during the analyzed period of time, while deterioration had been registered in the capital adequacy and liquidity level. Heys et al. (2009) examined the "Efficiency Ratios and Community Bank Performance." They developed a model to differentiate between low efficiency and high efficiency community banks that was multivariate discriminant using data for 2006-08. The model included proxies for banking regulatory CAMELS rating variables including: equity capital to total asset ratio, net charge-offs to loans, salaries to average assets, ROAA, liquidity ratio and 1 year GAP ratio. The model's classification accuracy ranges from 88% to 96% approximately, for both original and cross-validation datasets. Sangmi and Nazir (2010) evaluated the financial performance of the two major banks i.e; one biggest nationalized bank (PNB) and other biggest private sector bank (JKB) operating in northern India during 2001-2005. The position of the banks under study was

sound and satisfactory so far as their capital adequacy, asset quality, Management capability and liquidity was concerned.

Babar and Zeb (2011) examined the "CAMELS rating system for banking industry in Pakistan" with a sample of 17 commercial banks. They examined the similarities in the results generated by CAMELS rating system and PACRA rating agency. The results generated did not show any similarities with each other giving an indication of the banks that had gone on to bankruptcy in past three to four years or a future threat to financial sector of Pakistan.

Shar et al. (2011) examined the nationalization and de-nationalization of the banking industry in Pakistan using CAMEL parameters. It had been explored that the position of banks under study were sound and satisfactory with regards to capital adequacy, assets quality, management capabilities, earnings and liquidity. Dincer et al. (2011) analyzed "A Performance Evaluation of the Turkish Banking Sector after the Global Crisis via CAMELS Ratios" during 2002-2009. He found positive developments had seen in terms of the performance of State-owned, Privately-owned and Foreign Banks after 2001 and 2008 crisis. The equity ratio which had assigned for respective risks of banks after the crisis varied in parallel to macro-economic developments under the condition of banking rule about being above the ratio of 8%.

Jabeen (2011) examined the efficiency in the Banking Sector of Pakistan through quantitative analysis with qualitative inferences of 14 selected banks during 2006-10. It used the parametric OLS technique, using the definition of efficiency and the set of variables chosen from the CAMEL rating system of the regulators of financial institutions. She discussed the results in context of the background of the variables of assessment and their relationship to efficiency of banks. Said and Tumin (2012) investigated the impact of bank-specific factors which included the capital, credit, liquidity, operating expenses and size of commercial banks on their performance, which was measured by return on average assets (ROAA) and return on average equity (ROAE). The results of study showed that ratios employed had different effects on the performance of banks in both countries, except capital and credit ratios. Operating ratios influenced performance of banks in China, but this influence was not true for Malaysian banks regardless of the measure of performance.

Samadi (2012) measured the performance of privatized banks in Iran through two well-known financial figures including

ROA and ROE, two years before and after privatization program by using non-parametric. The results of study indicated that there was a meaningful difference between the performance of these banks before and after privatization program. Mehta (2012) examined the "Financial Performance of UAE Banking Sector" and made comparison of financial performance of banks, before and during crisis in UAE. The study covered a six year period from 2005 to 2010, which had been classified into before, during and after crisis period and included all banks listed on Abu Dhabi Stock Exchange. The performances of banks had been measured by financial ratios. He concluded that the recent global crisis had shocked the UAE bank's financial performance especially the profitability which was measured by ROA and ROE. All profitability ratios and liquidity of banks had decreased during the crisis period. On the other hand Leverage ratios of UAE's baking sector had increased during the crisis period as compared to pre-crisis period.

Iqbal (2012) investigating the Banking sector's Performance in Bangladesh and compared the 4 types of bank's performance on the basis of selected CAMELS ratios. The research attempted to find out correlation and relationship of different ratios and GDP contribution by financial intermediaries. Among the four categories of banks operating in Bangladesh, DFIs had been found more susceptible compared to rest of three categories. FCBs and PCBs showed all the positive signal of well functioning whereas SCBs also showed a trend of improving performance. Correlation between some ratios of CAMELS and GDP growth rate was also the same. Gebba and Ahmed (2013) evaluated the financial performance of Alexandria bank pre-post privatization over ten year's period (five years before and five years after privatization) by using CAMEL framework. The performance of the bank of Alexandria after privatization on average was significantly better at the level of capital adequacy and earnings. There was a significant difference between performance of the two stages and most likely in favor of privatization. Mishra et al. (2013) analyzed the soundness and measured the efficiency of 12 public and private sector banks based on market cap over a period of eleven years (2000-2011) in the Indian banking sector. CAMEL approach was used and it was established that private sector banks are at the top of the list, with their performances in terms of soundness being the best. DEA provided significant insights on efficiency of different banks and placed private sector ones at an advantage situation.

Data and methodology

CAMELS rating system has been applied on the data extracted from annual financial statements of the 15 commercial banks operating in Pakistan and listed at Karachi Stock Exchange (KSE-100) (see Appedix-1 for the list of banks). This research is a Cross-sectional study employing time series from fiscal year 2000-01 to 2011-12. Financial data of listed commercial banks has been provided on special request by the Securities and Exchange Commission of Pakistan (SECP). We have computed the average separately for each of the parameters used and each indicator from the CAMELS framework of ratios for the analyzed period of time (2000-2012). A panel data has been employed to represent information related to both time and space leading to 195 (15*13) total number of observations.

Initial statistical test

ADF, Co-integration etc, to check the Stationarity of Data and then Generalized Least Square (GLS)technique is applied on regression equation.

Classification of CAMELS Ratios

C stands for Capital adequacy: This is one of the most important indicators for the financial health of the banking sector. This indicates the banks capacity to retain capital proportionate with the nature and degree of all types of risks, as also the ability of the banks manager to identify measure, monitor and control these risks. (Suresh and Paul, 2010, P. 64)

A stands for Asset quality: The Asset quality of any financial institutions or firm is a significant determinant of its financial condition and health namely it's earning capability. This measure reveals the magnitude of credit risk prevailing in the bank due to its composition and quality of loans, off balance sheet activities, investment and advances.

M stands for Management quality: The growth of any financial institution or firm is greatly dependent on soundness of its overall management. Signaling the ability of the BODs and senior managers to identify measure, examine and control risks related with banking institutions. This qualitative measure provides work for risk management policies and processes as indicators of sound management.

E stands for Earnings and profitability: Itis added to base of capital while losses result in the wearing down of capital base. This indicator not only demonstrates the amount of and the trend in earnings but also analyses the sturdiness of expected earnings growth in future. For any financial institution to practicable in the long term, it has to be profitable. The generally used indicators for evaluating earnings and profitability of any institution are Return on Assets (ROA) and Return on Equity (ROE). ROA is the net profit after tax to total assets ratio. Higher the ROA means greater returns earned on assets deployed by the bank. While ROE is the net profit after tax to total shareholders' equity ratio. This ratio also illustrates the efficiency of bank, that how any bank uses its own capital in a competent manner (Christopoulos et al. 2011, p. 13).

L stands for Liquidity: Itis ability of a firm to convert its financial assets into cash most rapidly or we can say availability of the funds to pay off all its financial obligations when they become due. Liquidity of a firm can be calculated by using liquidity financial ratios (Baber & Zeb, 2011). This measure takes into consideration the sufficiency of the bank's current and prospective source of liquidity, including the strength of its funds management practices.

S stands for Sensitivity to market risk: It is latest addition to the ratings parameters and reveals the extent to which changes in foreign exchange rates, interest rates, commodity prices and equity prices can influence earnings and capital of banks. (Suresh and Paul, 2010, P. 64)

Ratios of CAMELS measuring framework

1. Capital Adequacy
   Capital to Assets = Total Capital / Total Assets
   Capital to Liability = Total Capital / Total Liabilities
2. Asset Quality
   Earning Assets to Total Assets = Total Loans & Advance / Total Assets
   NPLs to Gross advances = Total NPLs / Total Loans (gross)
3. Management Soundness
   Total Expenses to Total Income = Total Non-markup Expenses / Total Non- markup Income
4. Earnings and Profitability
   Return on Assets = Net Profit / Total Assets
   Return on Equity = Net Profit / Total Equity

5. Liquidity
   Loans to Deposits = Total Loans / Total Deposits
6. Sensitivity to Market Risk
   Size of bank's Assets = Bank assets / total assets of the banking sector.

Regression Analysis

In this study, we are measuring the Efficiency of banking sector which is checked by formulating regression equation. Most of research studies conducted in Pakistan are based on descriptive analysis; few have undertaken econometric analysis regarding this topic. This study is not only different in terms of choice of variables, but also applies different methodologies. For this purpose, researchers are using Efficiency ratio which is a popular proxy used by bank's financial analysts. The efficiency ratio measures how well the financial institution controls expenses relative to producing revenue and how productive in terms of generating income, managing assets and holding costs. (Hays et al. 2009; Jabeen, 2011 and Demireli et al. 2013)

Regression equation of the study

$$ER_{it} = \alpha_0 + \beta_1 (Capital\ Adequacy\ Ratio)_{it} + \beta_2 (Asset\ Quality\ ratio)_{it} + \beta_3 (Management\ quality\ ratio)_{it} + \beta_4 (Earnings\ and\ profitability\ ratio)_{it} + \beta_5 (Liquidity\ ratio)_{it} + \beta_6 (Sensitivity\ ratio)_{it} + X_t + \mathcal{E}_{it}$$

$$\mathcal{E}_{it} = v_i + u_{it}$$

Where:

ER_{it}= *Efficiency Ratio of bank i at time t.*
α_0= *Intercept of relationship in the model/constant*
$\beta_1 - \beta_6$ = *Coefficients of each independent or explanatory variable*
$\mathcal{E}_t$= *Error term or disturbance at time t.*
v_i = *Capturing the unobserved bank effect.*
u_{it}= *t he idiosyncratic error.*

While Efficiency Ratio, is commonly used to measure the financial performance that is ratio of non-interest expenses to total operating income. The efficiency ratio is calculated as overhead expenses are divided by sum of net interest income and NII or fee income. It determines how efficient is a bank in using overhead expenses including benefit costs and salaries; use other operating expenses in generating revenues.

Researcher applies the least squares methods of fixed effects (FE) and random effects (RE) models. This model was

tested by using panel data in the software E-VEIWS 6. Under a FE model the v_i's are considered fixed parameters to be estimated, while under a RE model the u_{it}'s are assumed to be random and the estimation method is generalized least squares (GLS).
Here, X_t denotes all the "untouched" control variables which are normally taken as vector if explanatory variables of the study (Deshmukh, 2003).

Analysis and Discussion

First of all, before choosing the suitable econometric model, there is a need to check the order of integration of time series data. In literature, it is argued that non-stationary as well as stationary time series data is a condition for determining co-integration property between sequences (Enders, 2004). For investigating the presence of unit root or to check the Stationarity of data by applying following test; Levin, lin and chu test, W-Stat, Augmented Dickey Fuller (ADF) test.

Table 4.5: Panel Unit Root Test

Panel unit root test: Summary				
Exogenous variables: Individual effects				
Newey-West bandwidth selection using Bartlett kernel				
Balanced observations for each test				
Method	Statistic	Prob.**	Cross- sections	
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.933	0.000	15	165
Null: Unit root (assumes individual unit root process)				
Im, Pesaran& Shin W-stat	-3.167	0.000	15	165
ADF - Fisher Chi-square	60.46	0.000	15	165
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.				

As presented in Table 4.5, null hypothesis (suppose common unit root) in levels can rejected for all the variables in equation of Levin, lin and chu test, and p-value is less than 0.05. Therefore, it can be concluded that, all variables are stationary at level.

The null hypothesis of unit root in levels can be rejected for the variables in equations of ADF- Fisher tests. Therefore it can be concluded that, all variables are stationary at level.

Fixed or Time Effect Model

Table 4.5.1: Fixed Effect Model

Effects Specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.6615	9	F - Statistic	9.53797
Adjusted R-squared	0.59222		Prob (statistic)	0.00000
Durbin-Watson stat	1.33350			
* Significant at 1% , **significant at 5%				

Dependent Variable: Efficiency Ratio				
Method: Panel Least Squares				
Sample: 2000 2012				
Periods included: 13				
Cross-sections included: 15				
Total panel (balanced) observations: 195				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Capital Adequacy Ratio	0.08123	0.16555	0.49065	0.624
Asset Quality 1	-0.31141	0.09256	-3.36441	0.001*
Asset Quality 2	-1.39633	0.55017	-2.53798	0.012**
Liquidity ratio	-0.04859	0.01595	-3.04517	0.006*
Management Quality	-0.00546	0.00969	-0.56327	0.574
Earning (ROA)	-4.09945	0.90710	-4.51927	0.000*
Sensitivity Ratio	-0.67121	0.44053	-1.52364	0.13
Constant	56.6529	6.99614	8.09773	0.000*

Using the Fixed Effect Model for panel data of 15 selected banks with annual data of thirteen years from 2000 to 2012. Out of the seven independent variables there are four significant independent variables; AQ1, AQ2, LR and ROA are significant with p-values at 0.0010, 0.001, 0.002 and 0.000. With 1% change in the independent variable AQ1, the dependent variable ER (efficiency ratio) reduces by 31.1% and the relationship is negative. With 1% change in AQ2, the dependent variable ER (efficiency ratio) change by 139.6% and the relationship is negative. One of the major problems of decrease in quality of assets was huge stock of NPLs. Not only banks were not earning any income on this bad portfolio, provisioning against such loans was further reducing their profits. In addition, banks pre-occupation in managing their existing portfolio instead of focusing on fresh lending was resulting in credit squeeze (SBP; FSA, 2001-02).

With 1% change in LR, the ER reduces by 4.85% due to negative relation. Maintaining adequate liquidity is necessary to meet the current and future obligations. The highly significant independent variable is earning, which is tabulated as net Income after tax divided by total Assets. This factor is negatively related to efficiency ratio. With one percentage change in earnings ratio, the efficiency ratio reduces by 409.94%. This result is validated by the theoretical background that when the profitability of the financial entity increases, so does the efficiency, shown by reduction in the efficiency ratio (Jabeen, 2011). While the capital adequacy ratio, management quality and sensitivity ratio have the positive coefficient value but they are statistically insignificant. For the constant, the p-value of 0.0000 and the constant value at 56.6529, shows significant factor. It means that if all the variables remain constant, ER or performance of banks is increased by 56.65%.

R^2 value is 0.66 or 66% which means that 66% variation in ER (performance of banking sector) is due to explained variables or independent variables while other 34% variation in ER is due to the variables which are not explained in model. The probability of value of F-statistics is 0.000, which means that all independent variables (CAMELS Ratio) can jointly explain or influence ER (Performance of banking sector) in population.

Random Effect Model

Table 4.4.2: Random Effect Model
Dependent Variable: EFF
Method: Panel EGLS (Two-way random effects)
Total panel (balanced) observations: 195
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAR	0.15984	0.17628	0.90673	0.3657
AQ1	-0.18994	0.08067	-2.35465	0.0196
AQ2	-1.58608	0.50834	-3.12012	0.0021
LIQ	-0.05895	0.01688	-3.49165	0.0006
MQ	-0.00624	0.00944	-0.66077	0.5096
ROA	-3.87489	0.83642	-4.63272	0.0000
SR	0.18565	0.20969	0.885352	0.3771
C	46.2262	5.32326	8.68382	0.0000
			S.D.	Rho
Effects Specification				
			S.D.	Rho

Cross-section random			2.60223	0.0962
Period random			0.00000	0.0000
Idiosyncratic random			7.97576	0.9038
		Weighted Statistics		
R-squared	0.281743	F-statistic		10.4790
Adjusted R-squared	0.254857	Prob(F-statistic)		0.00000
		Unweighted Statistics		
R-squared	0.296827	Durbin-Watson stat		0.86485

Under a Random Effect model the v_i's are assumed to be random and u_{it} the idiosyncratic error. The estimation method is generalized least squares (GLS). This method uses cross-section weights for every observed bank i at time t, and the true variance components, in order to produce a matrix-weighted average of the within and the between (which is obtained by regressing the cross section averages across time) estimators (see Baltagi, 2001).

In the Random Effect Model too, the same independent variables are significant. 1% change in independent variable AQ1 leads to a change of 18.9% in dependent variable ER (Efficiency ratio), in the reverse direction. 1% increase in AQ2 leads to decrease in ER by 158.60%. Similarly, one percentage change in the independent variable ROA (Earning) leads to a 387.48% reduction in the ER (Efficiency ratio). This is highly significant and negative relationship. The LR and ER have a significant relationship in the sense that a 1% positive change in the LR, leads to a 5.89% reduction in efficiency ratio (ER), which means that when the Liquidity improves, the efficiency ratio improves too.

In both Fixed and Random Effect model, the other independent variables; such as CAR as independent variable has a positive sign of 0.15984, showing that a 1% increase in CAR may lead to 15.98% increase in ER, but the relationship is not significant at predictability of p-value at 0.365. As CAR include broader perspective, both Assets and liabilities are under consideration. Capital adequacy ratios provide insurance about financial soundness against unforeseen event. It acts as a shield against expected losses related with risk attached to banks.

Another independent variable is MQ (Management quality), with 1% change in the MQ the ER changes by 0.624% and relation is negative. Since Management quality is proxy as total non-interest expenses/ total non-interest income, greater expenses the lower will be the ER. In fact, Non-interest expenses include the administrative expenses, Salaries and Benefits expense and others.

However, the results show insignificant relationship as this expense as a proportion of Income and as a proportion of total Assets is quite small, and expected to reduce further in percent terms as the size and the earning of the financial institution increases (jabeen, 2011).

Similarly, Sensitivity Ratio (SR) as independent variable has a positive sign of 0.1856, showing that a 1% increase in SR may lead to an 18.56% increase in ER, but the relationship is not significant at predictability of p-value at 0.337. The SR ratio is proxy as size of banks assets and calculated by the ratio of individual banks assets to the total assets of the banking sector. Thus, higher ratio, more significant is bank for that specified banking sector. The greater amount of individual assets of banks, the higher level of concentration of overall banking sector and their will the high inconsistency that exists between the larger and smaller banks. Hence, ER of large banks is increases and small banks are reducing.

Based on the above analyses, researcher can deduce that the CAMELS ratios do attempt to gauge the efficiency ratios of the sample under considerations. Within the seven independent factors, the AQR (AQ1 and AQ2), LR and ROA (Earning) have significant predictability.

Conclusion

This study has been initiated with the intention to fulfill the research objective that was to evaluate the impact of CAMELS Ratio on performance of banking sector in terms of Efficiency by using regression model. In order to accomplish this task, secondary data was collected from Securities and Exchange Commission of Pakistan, Financial Statement reports of State Bank of Pakistan and annual reports of the banks. As CAMELS measurement system is an internal rating system and its results are not available to the general public except the supervisory bank and management of the bank can have the results. Therefore, all the ratios were calculated and interpreted by the researcher.

Once results were generated after extensive mathematical calculations, measure the efficiency ratios of the sample under considerations. Due to panel data, both fixed and random effect models are applied. The finding shows that, out of the seven independent variables, the four have significant predictability these are Asset quality (AQ1, AQ2), Liquidity and ROA (Earnings). The results also show that the AQ1, AQ2, LR and ROA (Earning)

ratios are significant contributors to the ER, and these conform to previous studies. However, if efficiency ratio for the sample banks is simply found out, the ones which have a good efficiency ratio do not necessarily have the same standing in AQ1, AQ2, LR and ROA (Earning) ratios.

Recommendations

- Therefore, maintaining capital adequacy ratio as a part of statutory capital requirement of SBP is imperative for the banks operating in Pakistan.
- Banks in Pakistan must take protective measures by using its assets to general higher returns and safeguard bank's income sensitivity towards change in interest rates in the market.
- CAMELS rating and ranking system to be used as a regulatory supervisory rating system for the banking industry of Pakistan.
- SECP should critically evaluate procedures of national credit rating agencies and bring them to the level of international standard.

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Appendix A
List of sample Banks:

Table represents sample banks which are listed at Karachi Stock Exchange

Bank Name	Symbol	Branches	Shares (mn)	Year of Listing
Allied Bank Limited	ABL	806	1040.98	2005

Askari Bank Limited	AKBL	205	813.07	1992
Bank Al Falah Limited	BAFL	378	1349.16	2004
Bank Al Habib Limited	BAHL	277	1010.39	1992
Bank of Punjab	BOP	306	528.80	1991
KASB Bank Limited	KASBB	105	1950.86	1995
Faysal Bank Limited	FABL	225	927.35	1995
Habib Bank Limited	HBL	1459	1333.50	1992
Meezan Bank Limited	MEBL	310	1002.74	2002
National Bank Of Pakistan	NBP	1267	2127.51	2000
MCB Bank Limited	MCB	1132	1011.85	1992
NIB Bank Limited	NIB	178	10302.85	2003
Samba Bank Limited	SBL	28	808.24	2003
Soneri Bank Limited	SNBL	233	1102.46	1995
United Bank Limited	UBL	1106	1224.18	1992

Source: *Securities Exchange Commission of Pakistan (SECP) and State Bank of Pakistan (SBP).*