Impact of Cramel Model on the Financial Performance of Commercial Banks in Pakistan

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Abstract   *This paper analyzes the impact of CRAMEL model on commercial banks financial performance working in Pakistan. Firm financial performance used as dependent variable e.g. ROA, ROE and TQ whereas Capital Adequacy, Resource Allocation, Asset Quality, Management Efficiency, Earning Profitability and Liquidity were used as independent variables. Panel data was analyzed through ordinary least square, fixed effect and random effect models. Secondary data of twenty listed commercial banks on Pakistan stock exchange are used from the period of 2008 to 2017. Result of fixed effect model provided significant positive relationship among CA, RA and ROA, ROE, whereas EP and LIQ have substantial negative association with ROA and ROE. There is insignificant relation of AQ and EP with ROA and ROE. Furthermore, EP has substantial positive association with Tobin's Q whereas RA, ME and LIQ has substantial negative relation with Tobin's Q. Lastly CA and AQ have insignificant impact on Tobin's Q.*

Key Words: Return on Assets, Return on Equity, Tobin's Q, Capital Adequacy, Resource Allocation, Asset Quality, Management Efficiency, Earning Profitability, Liquidity, Pakistan Stock Exchange.

JEL Classification:

Introduction

Financial sector is the backbone of a country`s economy due to the fact that it supplies and circulate money. Banks are the basic element of financial sectors and are a very significant element of an economy in a sense that it promotes economics growth. Nevertheless, in time of crises the banks fail to respond it properly. As we have recent example of financial crises of 2007-2009. Therefore, a complete analysis is required to check the banks performance with the administrative factors, due to the fact that the economy of a country is sometime become problematic (Babar & Zeb, 2011; Ravichandran & Sharma, 2012). Recently, the banking sector around the globe has been to provide specialized services along with its old identity of financial intermediary. The industry has converted its operation to multiple services provider as per their customers need (Dang, 2011). Currently the most important sector of every country which can boost

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the economic development is the banking industry. To provide safe services to the customer and also a leading sector for every country, the banking industry should be regulated by specialized authority. It will give more confidence to the local customers as well as international market to utilize the facilities of banking industry without the fear of insolvency (Usman & Khan, 2012).

In the past, most of the study contributed using CRAMEL model for the evaluation of banks performance. Bodla and Verma (2006), Dash and Das (2009), and Gupta and Verma (2008) are some of the researchers examined the banking sector using CRAMEL model on the public sector, foreign and private banks of India. The results of these studies were similar in nature though the time frame was different for every study. Mishra and Aspal (2012) investigated state bank of India group with the help of CRAMEL model having various ratios as proxy of performance. As per their results the state bank was on the top list in terms of all parameters.

In the studies conducted in past, the subject model is used not frequently. However, the model is used by certain researcher only for the comparison of two banks or sectors. Still the bank performance is not assessed combined with R factor. Alam, Raza and Akram (2011) used thee model for the comparison of Islamic vs. conventional and private vs. public sector banks performance. Another study also assessed the conventional and Islamic banks performance with the help of this model (Usman & Khan, 2012). Shar, shah and Jamali (2011) provided a detailed investigation by comparing pre and post banking performance of Pakistani sector of nationalization. The same model has been used certain more studies by taking one or more of the aspect of the CAMEL ratio.

The needs to investigate the performance of the banks are very important rather than only comparing two banks or sector because CAMEL ratio is an important and concise assessment for the researchers as well as regulators also (Barr et al., 2002). Having no substantial study done in the context of Pakistan as per prior literature found on CRAMEL model.

Therefore, the current study has undertaken for the purpose to identify and evaluate the banking sector performance with the help of operating and market performance ratio. The inferences of the study will give a detail and better direction related to the Pakistani banks performance. A glimpse of the situations is also recognized with the help of ratio understudy as ROA, ROE provides operating performance results while TQ provides the market performance of the banks. The study also provided a guideline for investors who want to create a diverse portfolio bucket of securities according to their plan and investment. Student may also pursue their research area by selecting the same topic and utilizing the results of the current study as a comparison.

Literature Review

Mostly the research studies investigated the comparison of different banks rather than the complete set of sector and gap of efficiency and effectiveness. Nwankw (1991), stated that bank capital is those funds which are attributed to the proprietors and are published in the balance sheet. Cotswana's (2003) displays that interest rate for the expected balance market depends on the expected direction and intensity of expected changes. Nzzota (2004) also said that, if people believe that the interest rate of the market is increasing in the future, they encourage them to keep their wealth in the form of liquid assets so that the long run to avoid the capital. Get lost from time to time with the expected increase in interest rate.

Baber and Zeb (2011) conclude that banks do not show any similarities with each other. According to them it might be a sign of the banks which went on to bankruptcy in past 3-4 years or it may be a future risk for the bank working in Pakistan.

Bodla and Verma (2006) conclude that in term of CA state bank of India has an edge over the industrial credit and investment corporation, whereas in assets quality, earning quality and management quality industrial credit and Investment Corporation has edge over the state bank of India. Furthermore, position of liquidity of both industrial credit and Investment Corporation and state bank of India were sound and were not vary significantly.

Charitou (2019) results states that financial institutions having high operating expenses as a percentage of revenues have lower capital adequacy ratios. Furthermore, the which have profitable have higher capital adequacy ratios. Loan loss provision and earning coverage of net charge off have positive impact on capital adequacy ratio.

Rauf (2016) examined that private banks are best in all indicators of CAMEL and firm perform as well. But on the other side private banks were found less active as compared to public banks. In addition, Dang (2011) also stated that CAMEL rating system is advantageous as it has the flexibility of onsite and offsite examination and furthermore it is internationally standard rating analysis. The best tool for measuring the performance is CAMELS model, as it the power to capture the immediate change in performance when it occurs (Ghazavi & Bayraktar 2018).

Karri et al. (2015) finds that both public banks are good in respect to capital adequacy, because of having it above the Basel requirement. The loans to total assets of one bank are more than other one, which means that the prior bank is risker than the later one. While the total advance to customer was less as compared to later one bank, means that the bank is managing the deposit efficiently by converting it to advances. According to them there is no substantial alteration amongst financial performances of the two banks. But only have slight difference.

Hypothesis

Following are the hypothesis for the study which is based on the literature review discussed earlier.

- H1. There is no substantial association between banks capital adequacy and their financial performance
- H2. Resource allocations have negative and substantial impact in banks performance.
- H3. Asset quality has negative and significant impact on banks performance.
- H4. There is negative and substantial influence management efficiency on banks performance.
- H5. There is a negative and substantial association earning and profitability with banks performance.
- H6. Liquidity displays negative and significant association with banks financial performance.

Research Methodology

Population of this study composed of the overall Pakistani banking sectors. The banks selected as sample from the population are the top thirty banks of Pakistan. Due to the

non-availability of data for certain years or banks convenience sampling technique has been used from 2008 to 2017. The research used secondary data for period of 2008-2017 and is collected form state bank of Pakistan financial statement analysis, financial reports of banks and Pakistan stock exchange.

Variables

This study used banks financial performance as dependent variable and CRAMEL model as independent variables.

Return on Assets

Net income divided by total assets of the firm (Krishna at al., 1997).

Return on Equity

Total income divided by total equity of the firm (Sharma, 2010).

Tobin's Q

Market value of shares and boob value of debts divided by replacement cost (Hamid, 2010).

Capital Adequacy

Ratio of banks' ability to capture risk and liabilities (Sangmi & Nazir, 2010).

Resource Allocation

utilization of resources at optimum level (Churchman, 1968).

Asset Quality

Asset quality refers to the assessment of credit risk linked with specific assets (Abata, 2014).

Management Efficiency

this variable is termed as the ability of management to generate business and enhance profits. Expense ratio, earning per employee, loan size and per unit cost of lend amount are used as alternative (Kauko, 2007).

Earning Quality

Ability of bank to earn on regular basis. Specifically, define as profitability of the banks (Chisti, 2012).

Liquidity

Ratios assessing overall administration of the bank. The capacity of converting resources quickly into money is called liquidity (Farooq et al., 2015).

Model Specification

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$
Y: Financial Performance,

X1: Capital Adequacy,
X2: Resource Allocation,
X3: Asset Quality,
X4: Management Efficiency,
X5: Earning and Profitability,
X6: Liquidity

Result

Descriptive Statistics

In the appended table descriptive results are listed. A detail investigation has been provided for dependent and independent variables. The mean value for ROA is 0.55, providing that against the investment in assets of 1 rupee companies receives 0.55 in income. Whereas the mean values for TQ and ROE stood 0.95 and 0.25 respectively. On the other hand, standard deviation for ROA found 0.80 with skewness and kurtosis -0.45 and 0.92. The value of standard deviation, skewness and kurtosis for ROE and TQ resulted, 0.32 and 0.05, -0.91 and 0.43, 0.39 and 2.80.

In the review of CRAMEL analysis shows that the CA means value found 10.12 with SD of 3.41 whereas, skewness and kurtosis values are 0.56 and 1.12 respectively. This displays that banks utilized 10.12 of their assets and capital effectively which provides a better security for their depositors.

The average of RA provided 3.17 with SD of 1.21 and skewness and kurtosis of 0.19 and 1.11 of the banks respectively. AQ mean value has been resulted as 9.88 with standard deviation of 3.17, skewness 0.71 and kurtosis -0.42. The other variable ME descriptive summery found as the value mean of 15.64, SD of 4.20, skewness and kurtosis of -0.73 and 2.36 respectively. EP averaged 11.04 for Pakistani banks with SD, skewness and kurtosis of 5.39, 0.45 and 0.29 respectively. Lastly LIQ averaged 8.48 with SD 2.93 and skewness and kurtosis 1.57 and 2.26 respectively.

Table 1. Descriptive Statistics for all Variables

	Mean	Minimum	Maximum	SD	Sknws	Kurtosis
ROA	0.55	-1.81	1.96	0.80	-0.45	0.92
ROE	0.25	-1.29	1.33	0.32	-0.91	0.39
TQ	0.95	0.81	1.22	0.05	0.43	2.80
CA	10.12	0.56	20.89	3.41	0.56	1.12
RA	3.17	-0.25	6.99	1.21	0.19	1.11
AQ	9.88	0.50	19.04	3.17	0.71	-0.42
ME	15.64	7.39	16.80	4.20	-0.73	2.36
EP	11.04	0.01	28.58	5.39	0.45	0.29
LIQ	8.48	3.43	22.96	2.93	1.57	2.26

Correlation

The results of correlation has been listed in detail in the appended table 4.2, providing that ROA has positive correlation with CA, RA and LIQ and negative with AQ, ME and EP. The positive relation shows the direct variation between the variables while

negative provides inverse relation. The relation of ROE with rest of the independent variables also judged and found that CA, RA, EP and LIQ showing positive while AQ and ME negative. On the other side the correlation amongst the independent variables and TQ found positive for CA, RA, AQ and EP while negative for ME and LIQ.

Table 2. Correlation Matrix of all Variables

	ROA	ROE	TQ	CA	RA	AQ	ME	EP	LIQ
ROA	1								
ROE	0.68	1							
TQ	0.49	0.37	1						
CA	0.35	0.34	0.12	1					
RA	0.58	0.49	0.19	0.41	1				
AQ	-0.10	-0.07	0.07	-0.05	0.01	1			
ME	-0.04	-0.06	-0.05	-0.10	0.12	0.15	1		
EP	-0.01	0.07	0.22	0.12	0.04	0.37	-0.07	1	
LIQ	0.01	0.13	-0.09	0.08	0.29	-0.18	0.01	0.07	1

On the other hand for the confirmation variance inflation factor has also been used to check the statue of correlation amongst the variables. The value of VIF for all the concerned variables found below 10.0 which also confirmed that no multicollinearity assumption. Breusch-Pagan test revealed that data homoscedastic due to the insignificant P-value. For linearity assumption data has been converted with the help of natural log. The results of skewness proved that data is normally distributed and fit to be used for further analysis.

Regression

This study employs Ordinary least squares (OLS), Fixed Effect and Random Effect model of regression analysis. The result of OLS and Random effect model are not added in this paper. As after analyzing the data through Hausman Test this study uses result of Fixed Effect Random model.

Table 3. Fixed Effect Regression Results

	ROA		ROE		TQ	
Variables	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
Intercept	1.257	0.059	1.878	0.315	1.079	0.002
CA	0.098	0.048	0.341	0.027	0.181	0.282
RA	0.461	0.003	0.730	0.010	-0.015	0.005
AQ	-0.119	0.646	-0.131	0.506	0.210	0.939
ME	-0.013	0.038	-0.102	0.046	-0.031	0.053
EP	-0.038	0.267	0.039	0.862	0.171	0.000
LIQ	-0.043	0.004	-0.172	0.001	-0.034	0.004
R-Square	0.644		0.621		0.781	
Adj R²	0.593		0.576		0.730	
P-Value	0.000		0.000		0.000	

In the table above, regression results has been listed. The value of constant of the model ROA stood 1.257 and F-value found significant 0.000 shows the model fitness,

with adjusted R square of 59.3%. The variation in the dependent variable ROA found 59.3% by independent variables of the study. The relationship of CA found positive and significant, RA positive and significant, AQ negative and insignificant, ME negative and significant, EP negative and insignificant, and EIQ negative and significant respectively.

The constant value results for the second dependent variable ROE found 1.878 and F-value significant 0.000 shows the model fitness, with adjusted R square of 57.6%. The variation in the dependent variable ROE found 57.6% by independent variables of the study. The relationship of CA found positive and significant, RA positive and significant, AQ negative and insignificant , ME negative and significant, EP negative and insignificant and EIQ negative and significant respectively.

In the table above, regression results has been listed. The value of constant of the model TQ stood 1.079 and F-value found significant 0.000 shows the model fitness, with adjusted R square of 73%. The variation in the dependent variable TQ found 73% by independent variables of the study. The relationship of CA found positive and insignificant, RA negative and significant, AQ positive and insignificant, ME negative and significant, EP positive and significant, and LIQ negative and significant respectively. As per results the overall model are fit and the variation in dependent variables explained by independent variables are strong enough to support the current study and its objectives.

Conclusion

In the study, the role and influence of CRAMEL ratio has been judged with operating performance of Banks working in Pakistan. It shows that there is a definite impact of the CRAMEL model on the commercial banks performance. With reference to the role of different variables e.g. ROA, ROE and TQ the results of the study found some negative and also positive relation with CRAMEL model.

National and international Banks of a country always try to improve their performance in terms of services as well as in operation to cope market shares locally and beyond the boundaries with the aim to earn more profit. The overall results the study revealed that CRAMEL model is the most important factor influence on the performance of banks in Pakistan. The first hypothesis "There is no substantial association between banks capital adequacy and their financial performance" has been rejected due to the fact that ROA and ROE proxies found significant with CA. Second hypothesis "Resource allocations have negative impact in banks performance" also rejected due to the positive relation with two dependent variables ROA (significant) and ROE (insignificant), In case of TQ the same has been accepted. Third hypothesis "Asset quality has negative impact on banks performance" is found insignificant so therefore rejected. Fourth hypothesis "Management efficiency has a negative impact on performance" has been accepted due to the outcomes of the overall models found significant and negative. Fifth hypothesis of the study "Earning and profitability has negative relation with banks performance" has been rejected due to the insignificant relation with two model ROA and ROE, and also found positive and significant with TQ. The sixth and last hypothesis of the study "Liquidity shows negative relation with banks

financial performance" accepted because the results of the total three models found in line with the statement.

On the basis of the study it has been concluded that CRAMEL model impacts the banks performance and should be used by the management of the banks to identify and resolve the issue related to the operations. In the case of negative relation recognized in the current study, revealing that the focus of the banks management should be utilized on CRAMEL related areas for better performance in future by coping more market shares. Furthermore, banks management revising the CA, RA, AQ, ME, EP and LIQ as per the competitive market condition will provide opportunity to fill the gap of poor performance. Last but not the least the well-functioning banks of a country leads to economic development.

Ping and Kusairi (2020) examined and sated that CA and EQ have positive influence on bank performance, whereas AQ, ME, and LIQ have negative impact on bank performance. Having a high liquidity asset will reduce income by way of associated liquid assets with lower rates of return.

Karri et al. (2015) in his studies also found and proposed that public banks are good in respect to capital adequacy, because of having it above the Basel requirement. The loans to total assets of one bank are more than other one, which means that the prior bank is risker than the later one. While the total advance to customer was less as compared to later one bank, means that the bank is managing the deposit efficiently by converting it to advances. According to them there is no substantial alteration amongst financial performances of the two banks. But only have slight difference.

Recommendation for future Study

Some of the recommendations for future studies are appended:

1. More banks should be added in the future for more concrete analysis.
2. It should be better to use CRAMEL model in both developed and developing countries and further compare the results of the both analysis.
3. Comparison of public vs. public and private vs. private banks performance should also be evaluated amongst the developing and developed countries.
4. Along with CRAMEL model the merger and acquisition scenarios may also be undertaken to show the influence of the event also on the performance of the banks.
5. Time frame should be extended to more years.
6. The study may also be extended to other financial institutions like insurance companies, mutual funds and micro finance companies.

Research Limitations

1. Data availability of listed banks is not fully available on PSX.
2. The study is only limited to banking sector.
3. Only operating performance is taken under investigation of Pakistani Banks.
4. The time frame limited to 2008-2017.
5. Time constrained and limited resources.
6. The study is limited to developing country e.g. Pakistan only.

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