

## Examining the financial performance of banks using camel approach

Shahid Tanveer, Waqas Khaliq Bhatti \*, Khuram Shafi, Farhan Shahzad

*CIIT Wah Cantt, Pakistan*

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**Abstract:** The purpose of this study is to develop Financial Performance Index (FPI) on the basis of CAMELS ratio and then run the computed index. It includes unbalanced panel data covering the time span of 2010-2015. FPI is consisted of bank specific variables include; reserves (RSV), Operating Efficiency (OE), Overheads (OVHD), Deposits (DPST), Bank Size (SZE), and Profitability (PROF), financial variables include Market Capitalization (MCAP), Market Concentration (MCON), and Financial Freedom (FFRED), and macro-economic variables are Gross Domestic Product (GDP), the Real Interest Rate (RIR), and Political Instability (PLINST). The Generalized Least Square (GLS) regression results depict that Gross Domestic Product (GDP), Real Interest Rate (RIR), and Political Stability (PS) effect banks insignificantly. Therefore, it is suggested that bank managers should concentrate on controlling overheads and operating costs for the betterment of bank performance as both variables in our results are denoting an insignificant and negative relationship with FPI. Further, improvements in overall management practices and new standards in operating efficiency and financial risk management are essential to enhance performance of banks.

**Key words:** *FPI; Bank specific variable; Financial variables; Macro-economic variables; Operating efficiency; Financial risk management; GLS regression*

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### 1. Introduction

Banking sector during last couple of decades has many considerable revolutions. The revolutions in the banking industry brought effectiveness in operations and competition environment in banking sector. Through 1997 Pakistan's banking sector facing broad, difficult and also aching procedure. For advancement of savings, investment and growth in such institutes is economically strong and imitating their relations tightly with the original sector (Rashid & Jabeen, 2016). Even though reforms, symbols of enhancement are observable it is not possible to predict complete banking sector performance till the end. It is complicated to straighten out signs of development due to the different factor's concurrent nature. Banks are the important part for the economic development of country. Inefficient and unorganized banking system creates poor adjustments and hindrance in the process of improvement. A strong banking sector is very efficient for the escalation of economy as it provides finance to both clients and businesses. Vigorous banking sector provides safety in order to absorb negative shocks, and improves flourishing transformation. Healthy and well-functioning banking sector is necessary for the improvement of the different parts of market.

During the preparation of documents the performance of every sector is evaluated and what are the strengths and weaknesses they possess as per the rules of SBP. Supervisory framework followed by the central bank is CAMELS (Ishaq,

Karim, Zaheer, & Ahmed, 2016), which consists of following six indicators: Capital Adequacy, Assets Quality, Management Quality, Earnings Liquidity and Sensitivity to Risk.

Around the globe Islamic banking is growing faster in Pakistan comparatively conventional banking while commercial banking is going downwards throughout the world and in the countries which are founder of interest based financial system. These interest based countries are trying to involve financial crisis by decreasing the interest rates and brought down the interest rates to almost lowest level but again failed to achieve required goals (Bashir, 2001). Very old and base of strong financial systems is getting wiped out of the screen.

There is no. of products offered by Islamic banks. Murabaha is dominating the financing portfolio of Islamic Banking Institutions (IBIs), Similarly, Ijara, Musharaka and Diminishing Musharaka are also used noticeable share in total financing of IBIs. However, Mudaraba, Salam and Istisna portfolios still needs to be triggered. In this study CAMELS model is used for measuring the effect of bank, financial and macro-specific determinants to measure the performance of banks.

### 2. Literature Review

Rostami (2015) examined the effects on performance by the each category of the CAMELS model. Performance indicator is Q-Tobin's. Moreover, annual reports of Iranian and at the end;

the model is extracted from analyses. With CAMELS studies, banks can concentrate on risk and few significant ratios and try to control and manage the possible crisis. (Ferrouhi, 2014) examined major Moroccan financial institution's performance for the duration of 2001-2011 applying CAMEL model.

Prasad and Ravinder, (2012) examined banking sector's performance by choosing CAMELS model which is necessary for the calculation of banks performance through its parameters like Capital Adequacy, Assets Quality, Management Efficiency, Earning Quality and Liquidity. Ishaq et al., (2016) evaluates the financial accuracy and implementation and financial of commercial banks by CAMELS model. SBP implemented CAMELS model as a supervisory and administrative framework. Gupta, (2014) examined the Indian nationalized banks' performance by using the CAMELS approach from 2009 to 2013. Altan, Yusufazari, and Bedük, (2014) attempts to comprehensively analyze the financial health and performance of public and private banks in the state of Turkish banks and time is used from 2005-2012.

### 3. Methodology

CAMELS' model is performance evaluation tool in banking industry and to predict the future and relative risk. CAMELS model have following parameters Capital Adequacy (Micco et al.(2007), Management Quality (MQ), Assets Quality (AQ), Earnings Quality (EQ), Liquidity (LIQ) and Sensitivity to Risk (SENS). Parameters are given weights according to the importance they have in it. To analyze the performance of banks Financial Performance Index (FPI) was developed. On the basis of CAMELS parameters FPI is constructed. Afterward, this study examined the empirical factors of bank performance by taking bank-specific, macroeconomic, and financial indicators as independent variables and financial performance index is considered as a dependent variable.

The structure of financial performance index is divided into three steps:

$$\text{Standardized value } S_{ijt} = [(β_{ijt} - μ_{jt}) / σ_{jt}] \quad (1)$$

Where  $μ_{jt}$  represents mean of sample,  $σ_{jt}$  represents standard deviation of CAMELS parameter ( $j^{\text{th}}$  indicator) at time  $t$ , and  $β_{ijt}$  indicates individual CAMELS ratio for a particular time of bank  $t$ . Standardization is a normal distribution having standard deviation 1 and mean 0 and the key purpose for standardizing the variables is to get by combining the different scales variables to individual scale variable.

Next, the FPI of each performance parameter is constructed by calculating standardized value of individual ratio in CAMELS parameters with recommended weights. Every parameter is allocated a specific weight. Specially, weights are allocated by considering the gain earned by the bank and significance of the factors in CAMELS parameters

including asset quality, earnings, capital adequacy, and sensitivity to risk as these variables help in efficiency, growth and productivity of banks. Although management and liquidity are allocated slighter weight because high liquidity moderates profitability of banks. Additional information on performance parameters and their characteristics can be found in (Rashid & Jabeen, 2016). Following, Abbas, Tahir, & Rahman, (2012) we constructed equations to merge standardized value of each ratio of each CAMEL's parameter. Specifically, CAMEL's parameters for each bank are calculated as follows:

$$\text{Capital adequacy: } CA_{it} = W_{1it}S_{1it} + W_{2it}S_{2it} + W_{3it}S_{3it}$$

$$\text{Asset quality: } AQ_{it} = W_{1it}S_{1it} + W_{2it}S_{2it}$$

$$\text{Management: } MT_{it} = W_{1it}S_{1it} + W_{2it}S_{2it} + W_{3it}S_{3it}$$

$$\text{Earnings: } ES_{it} = W_{1it}S_{1it} + W_{2it}S_{2it} + W_{3it}S_{3it}$$

$$\text{Liquidity: } LY_{it} = W_{1it}S_{1it} + W_{2it}S_{2it} + W_{3it}S_{3it}$$

$$\text{Sensitivity to risk: } RK_{it} = W_{1it}S_{1it} + W_{2it}S_{2it}$$

where  $S_{it}$  is a standardized value of CAMELS' parameter of  $i^{\text{th}}$  bank at time  $t$ , while,  $W_{it}$  is the prescribed weight for any bank at time  $t$ . FPI of each bank for each year is calculated through capital adequacy ( $CA_{it}$ ), asset quality ( $AQ_{it}$ ), management ( $MT_{it}$ ), earnings ( $ES_{it}$ ), liquidity ( $LY_{it}$ ), and sensitivity to risk ( $RK_{it}$ ). Finally, we calculate the FPI for  $i^{\text{th}}$  bank as follows:

$$FPI_i = α_1CA_{it} + α_2AQ_{it} + α_3MT_{it} + α_4ES_{it} + α_5LY_{it} + α_6RK_{it} \quad (2)$$

Where  $α_j$  is the prescribed weight for banks  $i^{\text{th}}$  at time  $t$ .  $CA_{it}$ ,  $AQ_{it}$ ,  $MT_{it}$ ,  $ES_{it}$ ,  $LY_{it}$ , and  $RK_{it}$  are the CAMELS' performance parameters for  $i^{\text{th}}$  bank at time  $t$ .

After calculating the FPI for each bank included in the sample for each year we model the bank performance as follows:

$$FPI_{it} = f(\text{bank variables, financial indicators, macroeconomic indicators})$$

For estimation purpose, we write the equation (1) as follows:

$$\begin{aligned} FPI_{it} = & \beta_0 + \beta_1OVH_{Dit} + \beta_2RSV_{it} + \beta_3SZE_{it} \\ & + \beta_4OE_{it} + \beta_5DPST_{it} + \beta_6PROF_{it} \\ & + \beta_7Mktcap_{it} + \beta_8Mktcon_{it} \\ & + \beta_9FFRED_{it} + \beta_{10}GDP_{it} \\ & + \beta_{11}RI_{it} + \beta_{12}PLINST_{it} + \epsilon_{it} \quad (3) \end{aligned}$$

Where FPI is Financial performance index for  $i$  bank and time  $t$ . constant is  $\beta_0$  and  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11},$  and  $\beta_{12}$  are slope coefficients, although  $\epsilon_{it}$  is an error term with zero mean and finite variance. Bank specific variables include reserves (RSV), operating efficiency (OE), overheads (OVHD), deposits (DPST), bank size (SZE), and Profitability (PROF). Financial variables include market capitalization (MCAP) and market concentration (MCON), and financial freedom

(FFRED) and macro-economic variables are gross domestic product (GDP), the real interest rate (RI), and political instability (PLINST).

The secondary annual data was taken from 2010 to 2015 including all Islamic and Conventional banks (excluding small and govt. banks) for empirical analysis of study. For data collection we looked into the financial statement analysis of banking sector collected from SBP. SCS Trade and PSE websites are used for annual stocks information. The data on macroeconomic variables is collected from The Global Economy, SCS Trade, & World Bank databases. In this research, we have applied different methods for the purpose of getting our results. Analysis were done on Panel Data where linear regression, Fixed and Random Effects tests were utilized. Further, Hausman test for suitability of model for our tests between fixed and random effects was applied.

#### 4. Results

Empirical investigation started by presenting summary of the constructed performance index and independent variables. Table 1 presents that all variables have positive means ranging from (0071283) to (15676.09) except political stability which have a negative mean value (-2.617987) over the examined period.

##### 4.1. Correlation matrix

In Table 2, the relationship of FPI with Capital Adequacy and Assets Quality (AQ) is weak. Management Quality (MQ) shows semi-strong relationship with Financial Performance Index. Earnings (EARN) and Liquidity (LIQ) denotes Weak relationship. Sensitivity to Risk (SENST) indicates a semi-strong correlation.

**Table 1:** Descriptive summary

VAR.	MEAN	STD. DEV.	MIN.	MAX.
FPI	3.50192	0.5499501	2.234047	6.267385
CA	15676.09	191344.7	-0.0310347	2335661
AQ	0.5838334	0.6483132	0.0135294	5.267347
MQ	3.166767	2.532489	0.9576256	15.94234
ERN	0.0476138	0.4942484	-0.0589872	6.038511
LIQ	0.1209981	0.6780783	0	8.185093
SENS	0.1356434	1.141361	0.0008555	13.95622
OH	0.0615122	0.0199045	0.0242789	0.1249517
RES	2.627902	0.182896	2.030224	2.871849
SIZE	2.950815	0.627288	2.794678	3.068986
DEP	1.998223	0.8995906	-0.6308286	5.929045
OPEFF	0.4008685	0.5190105	-0.7168636	2.353988
PRO	0.0071283	0.116797	-0.0589872	0.0295785
MCAP	22.40367	5.623058	-3.940534	25.78805
MCON	20.26198	1.676139	5.384303	22.52996
GDP	5.269119	0.068408	5.178407	5.374815
RIR	1.806107	5.802831	-7.11	11.62
PS	-2.617987	0.12904	-2.81	-2.4

**Table 2:** Pair wise correlation

	FPI	CA	AQ	MQ	EARN	LIQ	SENST
FPI	1						
CA	-0.0829	1					
AQ	-0.0140	-0.0290	1				
MQ	0.4222	-0.0716	-0.0687	1			
EARN	0.2546	-0.0063	-0.0043	-0.0555	1		
LIQ	0.2406	-0.0126	-0.0117	-0.0226	0.9802	1	
SENST	0.4215	-0.0092	-0.0336	-0.0881	-0.0068	-0.0138	1
OH	0.1422	-0.0722	0.1410	0.1275	0.0248	-0.0054	0.0050
RES	0.4178	-0.0035	0.0694	-0.5160	0.0159	-0.0278	0.0977
SIZE	0.1532	-0.0315	-0	-0.6453	-0.0177	-0.0643	0.0876
DEP	0.1193	-0.0193	-0.0068	-0.165	-0.2072	-0.2480	0.0509
OPEF	-0.1383	-0.0269	0.1419	0.0631	0.0566	0.0709	-0.0036
PROF	0.0190	0.0183	-0.0252	-0.4546	0.0158	-0.0247	0.0775
MCAP	-0.1497	0.0141	-0.6551	0.0578	0.0110	0.0218	-0.3758
MCON	0.0367	-0.0077	0.0030	-0.3362	-0.0110	-0.0335	0.0536
GDP	-0.0978	0.1274	-0.0617	-0.2073	-0.0744	-0.0744	0.1256
RIR	-0.1116	0.1395	-0.0512	-0.2258	-0.0512	-0.0505	0.1369
PS	-0.0367	0.0498	-0.0846	-0.0953	-0.1229	-0.1216	0.0496

  

	OH	RES	SIZ	DEP	OPEF	PROF	MCAP
OH	1						
RES	-0.0046	1					

SIZE	-0.1054	0.8143	1				
DEP	0.1065	0.3504	0.3742	1			
OPEF	0.4533	-0.2403	-0.3008	-0.0587	1		
PROF	-0.3486	0.4910	0.5481	0.1043	-0.5665	1	
MCAP	-0.1748	-0.0564	0.0633	-0.0579	-0.1830	0.0135	1
MCON	-0.1060	0.3697	0.4892	-0.0474	-0.2283	0.3347	0.2398
GDP	-0.5146	0.0780	0.2073	0.0454	-0.1580	0.0937	0.0054
RIR	-0.5394	0.0709	0.2050	0.0215	-0.1660	0.1299	0.0050
PS	-0.2835	0.0747	0.1551	0.0753	-0.0765	-0.0177	0.0089

	MCON	GDP	PS	RIR
MCON	1.0000			
GDP	0.0170	1		
RIR	0.0145	0.9734	1	
PS	0.0319	0.7715	0.6196	1

Reserves denote semi strong correlation with the dependent variable. However, the Overheads, Size, Deposits, Operating Efficiency, Profitability, Market Capitalization, Market Concentration, Gross Domestic Product, Real Interest Rate and Political Stability depict weak correlation with the dependent variable FPI.

#### 4.2. Panel regression results

The correlation regression shows the relationship between two variables. In table 2 we have showed the relationship of Dependent variable Financial Performance Index (FPI) with independent variables. We have applied HAUSMAN test and its value is 0.9994 which means we will use FIXED effect. Capital adequacy refers towards measure of a bank's capital. So, having insignificant CA means banks do not have enough cushion to absorb a reasonable amount of losses before they become insolvent and consequently lose depositors' funds. One unit increase in CA will reduce FPI by -4.07% and the relationship is negative. (Anbar & Alper, 2011) indicate an insignificant relationship of Capital Adequacy with banks performance.

Assets Quality ratio has also higher P-value which shows insignificant relationship. One unit increase in AQ will increase FPI by 0.2% and the relationship is positive (Sawamy) shows insignificant impact of assets quality on bank performance. Management Quality (MQ) has a significant impact on the bank performance. One unit increase in MQ will increase dependent variable FPI by 19.7% and the relationship is positive. Since management quality is proxy as total non-interest expenses/ total non-interest income, greater expenses the lower will be the FPI. In fact Non-interest expense includes administrative expenses, Salaries & Benefits expense and other. (Rashid, 2016 #6) shows a significant relationship of management with the bank performance.

Earnings (EQ) have a positive impact on the banks performance. FPI will increase by 21% if we increase one unit in Earnings and they have a positive relationship. Delis and Staikouras, (2011) in their paper The Determinants of European Bank Profitability shows a positive impact of earnings on

their banks performance. Liquidity (LIQ) has a significant P-value which is less than 5%. It shows that by increasing one unit in Liquidity our dependent variable FPI will decrease by 9% and it's showing a positive relationship. Sensitivity to Risk (SESN) has a significant P-value which is 0.000 and is less than 5%. It denotes that increasing one unit in it will increase dependent variable FPI by 20%. The SENS (Sensitivity to risk) ratio is proxy as size of bank 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 the 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. Chou, (2016) shows a significant relationship between sensitivity to risk and bank performance Overheads (OH), Reserves (RES) and Size have P-Value 0.30, 0.000 and 0.026 which are less than 5% which indicates significant relationship with dependent variable.

Deposits have P-value of 0.118, Operating Efficiency (OPEFF) have 0.358, Profitability 0.333, Market Capitalization (MCAP) 0.956, Market Concentration (MCON) 0.973, while Gross Domestic Product (GDP) has P-value of 0.966, Real Interest Rate (RIR) with 0.818 and Political Stability (PS) with the P-value 0.789 shows insignificant relationship with the dependent variables.

Increasing one unit in Operating Efficiency (OPEFF) will bring 1% decrease in the dependent variable FPI (Financial Performance index). Profitability indicates that by increasing one unit of it will bring 39% decline in the FPI. MCAP (Market Capitalization) indicates that one unit increase in it will change FPI negatively by 0.3%. RIR (Real interest Rate) indicates a negative relationship and indicates that increasing one unit in RIR will bring FPI by 0.09%.

R<sup>2</sup> value is 0.98 or 98% which means that 98% variation in FPI (Financial Performance Index) is due to explained variables or independent variables while remaining 2% variation in FPI 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 can jointly explain or influence FPI in population.

**Table 3:** Dependent variables: Financial Performance Index (FPI)

	Fixed Effect:				Random Effect			
	COEF.	Std. Err.	T	P> t	COEF.	Std. Err.	T	P> z
CA	-4.07	1.38	-0.29	0.770	-4.28	1.33	-0.32	0.748
AQ	0.0028459	0.005619	0.51	0.614	0.002	0.005	0.55	0.583
MQ	0.1977669	0.001632	121.18	0.000	0.197	0.001	128.08	0.000
EARN	0.2146362	0.272779	7.87	0.0000	0.218	0.026	8.28	0.000
LIQ	0.0918646	0.0204015	4.50	0.000	0.088	0.019	4.51	0.000
SENS	0.2008285	0.0027803	72.23	0.000	0.200	0.002	81.02	0.000
OH	0.5292155	0.2403019	2.20	0.030	0.491	0.214	2.29	0.022
RES	2.350501	0.0496091	47.38	0.000	2.336	0.434	53.83	0.000
SIZ	0.8018095	0.3549647	2.26	0.026	0.791	0.189	4.18	0.000
DEP	0.011005	0.0069833	1.58	0.118	0.009	0.005	1.65	0.099
OPEFF	-0.01396	0.01511	-0.92	0.358	-0.019	0.012	-1.57	0.116
PROF	-0.39225	0.4033767	-0.97	0.333	-0.571	0.381	-1.49	0.136
MCAP	-0.00314	0.05680	-0.06	0.956	-0.000	0.001	-0.49	0.623
MCON	0.00193	0.056782	0.03	0.973	-0.000	0.002	-0.04	0.970
GDP	0.0189845	0.4410276	0.04	0.966	-0.022	0.430	-0.05	0.957
RIR	-0.00098	0.0042367	-0.23	0.818	-0.000	0.004	-0.15	0.884
PS	0.0182906	0.0680622	0.27	0.789	0.023	0.066	0.34	0.724
CONS	-5.783094	2.707204	-2.14	0.035	-5.482	2.477	-2.21	0.027
F-Stat	0.0000				0.0000			
R-sq	0.9830				0.9797			

Based on the above analyses, researchers can deduce that the CAMELS ratio, Bank specific, financial and Macro-economic variables do attempt to gauge the Financial Performance Index of the sample under consideration. Within the independent variables Management Quality (MQ), Earnings, Liquidity, Sensitivity to Risk, Overheads, Reserves and Size have significant predictability. The Hausman Test allows us to decide whether to choose between Random and Fixed Effect. For this purpose, we run Hausman test and our probability is 0.9994 which is greater than 0.5%. So, we will retain the fixed effect.

**Table 4:** Durbin–Wu–Hausman Test

	Value	Probability
Chi-Sq	3.61	0.9994

## 5. Conclusion

Purpose of this study was to examine the determinants affecting the Islamic and conventional banks financial performance. For this purpose, we have examined and shown the results of determinants. We have found out that there are many significant variable affecting the performance of banks. Banks also need to focus on the insignificant variables to improve their performance. To check whether we should apply random or fix effect we have applied Durbin–Wu–Hausman test which allows us to guess between both tests. Overall we have find out that Capital Adequacy, Assets Quality, Deposits, Operating Efficiency, Profitability, Market Capitalization, Market Concentration, GDP, RIR And Political Stability have insignificant relationship with Dependent Variable FPI. They are not causing the required effect. Management Quality, Earnings, Liquidity, Sensitivity to risk, Overheads,

Reserves and Size are the significant variables and statistically are affecting the dependent variable FPI.

The empirical analysis carried out in this study also provided an opportunity to academia, bank management, and practitioners to understand how different bank-specific variables, financial indicators, and macroeconomic factors affect the financial performance of Islamic and conventional banks differently. Bank managers may focused on controlling overheads and operating costs to improve performance because, according the empirical results presented in the study, both of these variables are negatively related to the FPI. Developments in whole management activities and latest procedures in operating efficiency and financial risk management are essential for enhancement of profitability.

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