International Journal of Business and Management Review
Vol.3, No.11, pp.41-53, December 2015
Published by European Centre for Research Training and Development UK (www.eajournals.org)

BANK PROFITABILITY, INFLATION AND COST EFFICIENCY: A CASE OF PAKISTANI BANKS

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ABSTRACT: *The study investigates the impact of internal and external factor and macro-economic variables on profitability on commercial banks of Pakistan. Dependent data analysis confirms that the bank size, capitalization, labor productivity, concentration and inflation were significant impact on the bank profitability in Pakistan.*

KEYWORDS: Bank, Profitability Analysis, Inflation, Cost Efficiency, Pakistan

INTRODUCTION

Banks provide a safe and accessible environment for individuals and economic entities to deposit excess funds additionally, banks also provide a service by packaging deposits into loans that are made available to economic agents (individuals and entities) in need of funds.

A monetary is an institution that facilitates the flow of funds between individuals or other economic entities having a surplus of funds (savers) to those running a deficit of funds (borrowers). Banks are a classic example of financial institutions.

Commercial banks are also called scheduled banks because they are registered with the state bank. Commercial banks are bond to follow rules and regulations implemented by the state bank of Pakistan. State bank have full control on all commercial banks. All commercial banks keep 25% of their deposits as reserve with state bank of Pakistan. State bank has right to change this rate anytime. Any commercial bank which does not follow policies and rules assigned by the state bank of Pakistan would not be called as scheduled or registered bank because state bank has right to do so.

Banks provide funds for value uses at higher rates also decreases risk and cost and generate economic activities too.

National bank of Pakistan is the only bank driven by the government but most of its assets are owned by the private sector.

Increase in bank assets, caused a huge rise in industry size i.e. 3 times (4 trillions). In Pakistan banks are contributing 55-80% to GDP. In a research of World Bank, Pakistan has attained 2nd rank according to performance by utilizing the resource mobilization, poverty elimination, production distribution policy banking sector improved very well.

Commercial banks have direct influence in economic development of a country because of savings rates, capital mobilization, agricultural and industrial development. Commercial banks

ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)

have a good role in increasing saving habits in people and also improved the investment rates in general public and businessmen. In this situation it has direct influence to the rational behavior of economy.

Banks play a vital role in today's era. It mobilizes saving and provides shuttle two the people who have taken part indirectly or directly.

In the past era, banking has really contributed in improving living standards, quality services and safe guarding the assets of people. Banks have attained more level of confidence by general public, just because of modernization. Monetary policy directly effects market surplus because of interest rates granted to borrowers and lenders. Banks usually change the interest rates for keeping and withdrawing the surplus money held in market.

When banks increasing interest rates this reads lower level of interest rents which can cause less to the general public. On the other side inflation is the situation when cost of goods and services is more than the living standard of that particular area.

Inflation discourages investor and also leaves negative influence on the market but if we decreases inflation rate it would be definitely lead to GDP and GDP is directly proportional to living standard.

LITERATURE REVIEW

This sector examines the experiential work taken by different researchers in relation of Bank profitability, inflation, and cost efficiency of the banks. The eventual performance of commercial banks is entirely depends upon the management attitude toward risk. Higher the liquidity means less the risk have drawbacks/ disadvantages of the profitability as concluded by important variable terms and saving deposits are proportional to the total deposits.

Bank performance in terms of profits of banks can be determined by external and internal factors. Internal factors are related to the management whereas external factors are other than those.

(Short 1979, bourke1989), were one of the early researches on bank profitability. Numerous empirical studies were held to find out the bank profitability.

Abreu and Mendes (2002) studies on bank and interest for the periods of 1986 to 1999 shows influence of variables on profits of banks. To lower the bank corrupts banks also followed the well capitalization. It also lead higher interest margin.

Bourke (1989, he found that there is resemblance in banks profit and adequacy of capital that means high capital lends to high profits.

If banks income/ profit increase with the rise in inflation it determines the performance of banks. (Asli Demirgüç-Kunt and Harry Huizinga1, 1997, 1998)

Main things is high inflation rate implies high interest rates , which mean high income but it lead to a very bad effect of borrowers, performance of financial sector is declared trough growth in GDP and it also effects the bank profitability (Perry , 1992)

ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)

When the GDP growth comes the positive influence, while the performance of the baking and industry sector and the growing of the GDP the banks has more profitability and will lend more money (Hasan, 2003)

Troughout the pakistan, the case found that the significant impact on the profitability by their equity and deposits where disabilities in economy increasing their assets and increasing their profits which impact insignificant on profitability. (Javaid et.al, 2011)

Data and Variables

Our data is collected of annual figures from 26 commercial banks from the period 2008-2012. The banks we used that the commercial banks of Pakistan and we collected the data from the website of state bank of Pakistan. The sample we collected from the annual reports of different commercial banks and from the financial statement analysis which is published by state bank of Pakistan. In total our sample control 130 firms a year observations.

There is the list where variables mentioned with notation in the table shown below. The table show the determinants factor of the bank profitability there the previous literature also shown and its included in the study.

In 2008, the inflation rate is 20.3 per cent, and in 2009 13.6 percent in 2010 13.3, in 2011 inflation rate 11.9 percent and in 2012 the inflation rate is 9.7 here lower point higher the above period, while it attains the peak point in 2008, i.e. 20.3 percent.

Variables	Notation	Measurement	Expected effect	Type	Source
ROA		Net income / total assets		Bankspecific	commercial banks
NIM		Net interest income/ earning assets		Bankspecific	commercial banks
Bank size	size	Log of total assets	?	Bankspecific	commercial banks
Credit risk	LLPTA	Loan loss provisions/total loans	-	Bankspecific	commercial banks
Liquidity	LA	Loans/assets	?	Bankspecific	commercial banks
Taxation	TOPBT	Tax/operating profit before tax	+	Bankspecific	commercial banks
Capitalization	ETA	Shareholder's equity/total assets	?	Bankspecific	commercial banks
Costefficiency	CE	Overhead expenses/total assets	?	Bankspecific	commercial banks
Non-traditional activity	NTA	Non-interest income/gross revenues	?	Bankspecific	commercial banks
Labour productivity	LP	Gross revenue/number of employees	+	Bankspecific	commercial banks
Concentration	Conc	Total assets of largest five banks / total asstes of the banking whole industry	?	Industry specific	bank regulartory commission
Banking sector development	BSD	bank assets / GDP	+	Industry specific	bank regulartory commission
Inflation	Inf	Annual inflation rate	?	Macro	world bank

Notes = (+) sign means positive effect, (-) sign negative effect, (?) sign means no effects

ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)

The table shows the variables considered in this study and the variables used to represent profitability (including signs) and its descriptive statistics are also present in the above table. The expected effects of the determinants or variables in accordance with the previous study and literature.

METHODOLOGY

The data for different variables used in the study were obtained from financial statement analysis of initial sector published by state bank of Pakistan. The estimation period is from 2008 – 2012 and all the commercial banks operations in Pakistan were considered some banks were omitted on the data for some years were missing. In total our sample constituted of 26 banks and 130 firms a year observation for every variable used in the study. The period of 2008 to 2012 is roburst because Pakistan faced economic crisis and recovery during this period.

Based line estimation model

In order to test our hypothesis we will estimate the following base line estimation models

$$(ROA)_{i,t} = \alpha_0 + \beta_1((la)_{i,t} + \beta_2(size)_{i,t} + \beta_3(llp)_{i,t} + \beta_4(tobt)_{i,t} + \beta_5(cap)_{i,t} + \beta_6(ce)_{i,t} + \beta_7(nta)_{i,t} + \beta_8(lp)_{i,t} + \beta_9(conc)_{i,t} + \beta_{10}(dev)_{i,t} + \beta_{11}(inf)_{i,t} + \sum_{I,t}$$

$$(NIM)_{i,t} = \alpha_0 + \beta_1((la)_{i,t} + \beta_2(size)_{i,t} + \beta_3(llp)_{i,t} + \beta_4(tobt)_{i,t} + \beta_5(cap)_{i,t} + \beta_6(ce)_{i,t} + \beta_7(nta)_{i,t} + \beta_8(lp)_{i,t} + \beta_9(conc)_{i,t} + \beta_{10}(dev)_{i,t} + \beta_{11}(inf)_{i,t} + \sum_{I,t}$$

Where,

ROA=Return on assets, estimated by taking ratio of net profit to total assets. This variable is used to providing the profitability of the firm as used in the study conducted by Hassan, bashir.

NIM= Net interest margin, estimated by taking ratio of the net interest income to the earning assets of the banks or industry there have a numbers of method to used where investor can evaluate their performance.

Bank Size (size) = Bank size is estimated by taking the log of the total assets of the banks and industry and it can used to the assets of the banks.

Liquidity (la) = liquidity is estimated by taking the ratio of the loan to the total assets and it can use to measure the cash in the banks and industry.

Credit risk (llp) Credit risk is estimated by the taking ratio of the loan loss provision to the total loans of the bank and industry.here the industry find the risk of the whole industry for the future.

Taxation (tobt) = Taxation is estimated by taking ratio of the tax to the operating profit before tax. The government is collected tax from the public for their services proving to their public.

Capitalization (cap) = capitalization is estimated by the taking ratio of the shareholder equity to the total assets of the banks. It can measure the equity of the shareholders in the industry.

ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)

Cost efficiency (ce) = Cost efficiency is estimated by the taking ratio of the overhead expense of the industry to the total assets of the banks. If the efficiency of the banks is more its better in postion to gain profit in the whole banking industry.

Non-traditional activity (nta) = Nontraditional activity, is estimated by the taking ratio of the net interest income to the gross revenue of the industry its used to estimate the social activity of the banking industry.

Labor productivity (LP) = Labor Productivity is estimated by the taking ratio of the gross revenue to the number of employees. If the labor productivity is high the work more efficient whiles the works slowly.

Concentration (ce) = concentration is estimated by the taking ratio of the total assets of the largest five banks to the total assets of the whole banking industry. If concentration of bank is more, its state to be concentrated.

Banking sector development (dev) = Banking Sector Development is estimated by the total bank assets to the GDP annual inflation rate of the country given by government of Pakistan which shown in the state bank website.

Common Effect Model

Both in order to estimates the effect of different independent variables where estimates the following common effect model.

$$(ROA)_{i,t} = \alpha_0 + \beta_1((la)_{i,t} + \beta_2(size)_{i,t} + \beta_3(llp)_{i,t} + \beta_4(tobt)_{i,t} + \beta_5(cap)_{i,t} + \beta_6(ce)_{i,t} + \beta_7(nta)_{i,t} + \beta_8(lp)_{i,t} + \beta_9(conc)_{i,t} + \beta_{10}(dev)_{i,t} + \beta_{11}(inf)_{i,t} + \sum_{I,t}$$

$$(NIM)_{i,t} = \alpha_0 + \beta_1((la)_{i,t} + \beta_2(size)_{i,t} + \beta_3(llp)_{i,t} + \beta_4(tobt)_{i,t} + \beta_5(cap)_{i,t} + \beta_6(ce)_{i,t} + \beta_7(nta)_{i,t} + \beta_8(lp)_{i,t} + \beta_9(conc)_{i,t} + \beta_{10}(dev)_{i,t} + \beta_{11}(inf)_{i,t} + \sum_{I,t}$$

Common effect model run under the exemption of homogeneity. We may not get roburst result because our banks consists of stable old players while other banks are relatively new further the sample consist of some banks that are global players while most of the banks are confined to the national boundary. Thus the exemption of homogeneity may prevent us to get roburst at the common effect model.

Fixed Effect Model

We estimates the following fixed models

$$(ROA)_{i,t} = \alpha_i + \beta_1((la)_{i,t} + \beta_2(size)_{i,t} + \beta_3(llp)_{i,t} + \beta_4(tobt)_{i,t} + \beta_5(cap)_{i,t} + \beta_6(ce)_{i,t} + \beta_7(nta)_{i,t} + \beta_8(lp)_{i,t} + \beta_9(conc)_{i,t} + \beta_{10}(dev)_{i,t} + \beta_{11}(inf)_{i,t} + \sum_{I,t}$$

$$(NIM)_{i,t} = \alpha_i + \beta_1((la)_{i,t} + \beta_2(size)_{i,t} + \beta_3(llp)_{i,t} + \beta_4(tobt)_{i,t} + \beta_5(cap)_{i,t} + \beta_6(ce)_{i,t} + \beta_7(nta)_{i,t} + \beta_8(lp)_{i,t} + \beta_9(conc)_{i,t} + \beta_{10}(dev)_{i,t} + \beta_{11}(inf)_{i,t} + \sum_{I,t}$$

Fixed effect model is a part of estimation techniques and allows for heterogeneity it has unique intercept for every cross sectional units and thus it allows for controlling the bias cause by omission of variables.

ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)

Random effect model

We estimate the following random effect models.

$$(ROA)_{i,t} = \alpha_0 + \beta_1((la)_{i,t} + \beta_2(size)_{i,t} + \beta_3(llp)_{i,t} + \beta_4(tobt)_{i,t} + \beta_5(cap)_{i,t} + \beta_6(ce)_{i,t} + \beta_7(nta)_{i,t} + \beta_8(lp)_{i,t} + \beta_9(conc)_{i,t} + \beta_{10}(dev)_{i,t} + \beta_{11}(inf)_{i,t} + \sum_{I,t}$$

$$(NIM)_{i,t} = \alpha_0 + \beta_1((la)_{i,t} + \beta_2(size)_{i,t} + \beta_3(llp)_{i,t} + \beta_4(tobt)_{i,t} + \beta_5(cap)_{i,t} + \beta_6(ce)_{i,t} + \beta_7(nta)_{i,t} + \beta_8(lp)_{i,t} + \beta_9(conc)_{i,t} + \beta_{10}(dev)_{i,t} + \beta_{11}(inf)_{i,t} + \sum_{I,t}$$

Random effect model is also a part of estimation techniques and control for the bias cause by error term.

Haussmann Model

Sometimes fixed effect and random effect model gives conflicting results. Hypothesis ratio can be determined by the best model for robust test and generalization. To conduct Haussmann test under the following hypothesis

H_1 = fixed effect model results are accepted.

H_0 = random effect model results are accepted.

A P-values of 0.05 or less will allow us to accept the results of fixed effect model and vice versa.

RESULTS AND DISCUSSION

Annual data to estimate bank`s performance empirically for the period 2008 to 2012. Variables are used for this purpose.

There are two effects that are used in this study; those are known as fixed and random. Haussmann test on some model indicates the difference between fixed and random models. It also provides the evidences I favor of random effects model.

Summary Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
roa	130	0.000726	0.019536	-0.05899	0.030612
nim	130	0.025731	0.029393	-0.11256	0.072881
la	130	0.458176	0.091365	0.2987	0.7086
size	130	18.73362	1.26768	16.06482	20.99798
llp	130	0.088626	0.059564	0.001436	0.279653
tobt	130	0.259818	0.30633	-1.53842	0.769018
cap	130	0.112927	0.078414	-0.02484	0.386972
ce	130	0.130882	0.035112	0.080049	0.230323
nta	130	1.268949	2.550637	-2.20213	13.6793

ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)

lp	130	223.2712	1288.411	-3933.84	2512.364
conc	130	0.194576	0.004478	0.186949	0.199783
dev	130	0.017546	0.019273	0.000777	0.076873
inf	130	0.1388	0.035545	0.097	0.203

The table show that the summary statistics from the year 2008 to 2012, here we find that ROA lower than the NIM. there is the difference in bank size , cost efficiency and liquidity comparing with the other variables , we see in the minimum and maximum values where the labor productivity is more and concentration of the banks less as the labor productivity and the inflation is increasing year by year. The correlation between size and bank profitability is 1.27 which relates the positive relationship between them. The other variables likes as labor productivity cost efficiency and banking sector development there correlation with the banks are positive. The correlation matrix table shown below:

Correlation Matrix

	la	size	llp	tobt	Cap	ce	nta	lp	roa
roa	1								
la	-0.116	1							
size	0.4865	0.0858	1						
llp	-0.427	-0.1187	0.0794	1					
tobt	0.1026	-0.04	0.0017	-0.1354	1				
cap	-0.1178	-0.1652	-0.5096	0.0899	-0.0092	1			
ce	-0.8621	0.2446	-0.5294	0.367	-0.0364	0.2331	1		
nta	0.1805	0.1821	0.0332	-0.2066	-0.1347	-0.0161	-0.1096	1	
lp	0.9297	-0.2065	0.5384	-0.3541	0.0473	-0.0804	-0.814	0.1083	1
conc	0.121	0.2012	-0.0264	-0.0488	-0.0172	0.0916	-0.0595	-0.0107	0.1035
dev	0.4703	0.145	0.8404	-0.036	0.0189	-0.289	-0.4923	-0.0171	0.5535
inf	-0.1555	0.5069	-0.2041	-0.1625	0.0352	0.1628	0.1723	0.0114	-0.1563

ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)

	La	size	llp	tobt	cap	ce	nta	lp	nim
Nim	1								
la	-0.2579	1							
size	0.1289	0.0858	1						
llp	-0.4418	-0.1187	0.0794	1					
tobt	0.0986	-0.04	0.0017	-0.1354	1				
cap	0.2284	-0.1652	-0.5096	0.0899	-0.0092	1			
ce	-0.6275	0.2446	-0.5294	0.367	-0.0364	0.2331	1		
nta	0.1419	0.1821	0.0332	-0.2066	-0.1347	-0.0161	-0.1096	1	
lp	0.7578	-0.2065	0.5384	-0.3541	0.0473	-0.0804	-0.814	0.1083	1
conc	0.1317	0.2012	-0.0264	-0.0488	-0.0172	0.0916	-0.0595	-0.0107	0.1035
dev	0.242	0.145	0.8404	-0.036	0.0189	-0.289	-0.4923	-0.0171	0.5535
inf	-0.1307	0.5069	-0.2041	-0.1625	0.0352	0.1628	0.1723	0.0114	-0.1563

There are mainly two reasons to use ROA as one of the measurement of bank profitability. Firstly its indications profit earned per unit of assets and returns the management ability to utilize banks' financial and real investment resources to generate profit (Hassan and Bashir, 2003).

The variables used in multivariate regression analysis, correlation table gives information about the level of resemblance between variables used for…

The matrix shows that correlation between the independent variables is unsatisfactory. It also suggests about multi collinearity problems. Kennedy (2008) says about this problem, that the correlation is about 0.8, which is not applicable here.

Firstly we show the table with the dependent variable, starting with ROA which is highly coefficient on banks profitability, table shown on the next page.

Common effect model shows the resemblance of the data is based on same banks only. that's why we use model. We use CEM with standard errors it show results that all variables are insignificant.

This table shows that there is no correlation between the independent variables. So independent variables are not correlating with each other.

After that, we use **fixed effects model** is a tool that is statistical that shows the obtained quantities in terms of variables that are considered as quantities were non-random.

The results came of fixed and random effect model, there conflicts between random and fixed effect model so we use the Haussmann test to give us the final results which model is best to select. The Haussmann test says that the random effect model is best to choose here the values are significant and best.

So in random effect model, here LA is positive and significant, TOBT is positive and significant, CE is negative and significant, LP is is positive and significant, INF is negative and its significant values.

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COMMON EFFECT MODEL

Roa	Coef.	Std.Err.	t	P>|t|
La	0.037979	0.00722	5.26	0
Size	-0.00043	0.00099	-0.43	0.667
Llp	-0.00863	0.010773	-0.8	0.425
Tobt	0.00456	0.001582	2.88	0.005
Cap	0.007661	0.008233	0.93	0.354
Ce	-0.20395	0.025712	-7.93	0
Nta	0.000292	0.0002	1.46	0.146
Lp	1.06E-05	7.42E-07	14.25	0
Conc	0.168428	0.126057	1.34	0.184
Dev	-0.09048	0.053935	-1.68	0.096
Inf	-0.05915	0.019522	-3.03	0.003
Cons	-0.00897	0.028441	-0.32	0.753

FIXED EFFECT MODEL

Roa	Coef.	Std.Err.	t	P>|t|
La	0.054116	0.01179	4.59	0
Size	0.002843	0.004249	0.67	0.505
Llp	-0.00267	0.024429	-0.11	0.913
Tobt	0.003589	0.001833	1.96	0.053
Cap	0.025095	0.014244	1.76	0.081
Ce	-0.18426	0.028523	-6.46	0
Nta	0.000291	0.000214	1.36	0.176
Lp	1.05E-05	9.01E-07	11.67	0
Conc	0.123815	0.158022	0.78	0.435
Dev	-0.02119	0.267928	-0.08	0.937
Inf	-0.06248	0.041937	-1.49	0.14
Cons	-0.0745	0.067033	-1.11	0.269

RANDOM EFFECT MODEL

Roa	Coef.	Std.Err.	z	P>|z|
La	0.04232	0.007765	5.45	0
Size	-0.00015	0.001244	-0.12	0.902
Llp	-0.01271	0.012339	-1.03	0.303
Tobt	0.004146	0.001525	2.72	0.007
Cap	0.01121	0.008912	1.26	0.208
Ce	-0.19927	0.025072	-7.95	0
Nta	0.000293	0.000195	1.5	0.133
Lp	1.05E-05	7.65E-07	13.72	0
Conc	0.176577	0.118279	1.49	0.135
Dev	-0.09609	0.069206	-1.39	0.165
Inf	-0.06674	0.020027	-3.33	0.001
Cons	-0.01705	0.029128	-0.59	0.558

Haussmann show the p=0.6 so random effect model accepted.

Now table with the dependent variable NIM is shown on next page:

ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)

COMMON EFFECT MODEL				
Nim	Coef.	Std.Err.	t	P>|t|
La	0.004439	0.020692	0.21	0.831
Size	-0.00856	0.002838	-3.02	0.003
Llp	-0.07116	0.030877	-2.3	0.023
Tobt	0.005614	0.004534	1.24	0.218
Cap	0.08264	0.023597	3.5	0.001
Ce	-0.13979	0.073694	-1.9	0.06
Nta	0.000598	0.000572	1.04	0.299
Lp	1.47E-05	2.13E-06	6.89	0
Conc	0.724309	0.361292	2	0.047
Dev	0.265673	0.154583	1.72	0.088
Inf	-0.16599	0.055951	-2.97	0.004
Cons	0.071222	0.081515	0.87	0.384
FIXED EFFECT MODEL				
Nim	Coef.	Std.Err.	t	P>|t|
La	0.016425	0.028282	0.58	0.563
Size	-0.01468	0.010193	-1.44	0.153
Llp	-0.01758	0.058603	-0.3	0.765
Tobt	0.002605	0.004397	0.59	0.555
Cap	0.052679	0.03417	1.54	0.127
Ce	-0.17376	0.068424	-2.54	0.013
Nta	0.000794	0.000512	1.55	0.124
Lp	1.35E-05	2.16E-06	6.24	0
Conc	0.894121	0.379077	2.36	0.02

ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)

Dev	0.203977	0.642731	0.32	0.752
Inf	-0.21034	0.100602	-2.09	0.039
Cons	0.158598	0.160805	0.99	0.327
RANDOM EFFECT MODEL				
Nim	Coef.	Std.Err.	z	P>|z|
La	0.006173	0.021514	0.29	0.774
Size	-0.00999	0.004333	-2.31	0.021
Llp	-0.04876	0.037642	-1.3	0.195
Tobt	0.004118	0.003821	1.08	0.281
Ap	0.065124	0.02482	2.62	0.009
Ce	-0.15572	0.061835	-2.52	0.012
Nta	0.000774	0.000482	1.61	0.108
Lp	1.39E-05	1.96E-06	7.1	0
Conc	0.782173	0.292351	2.68	0.007
Dev	0.322268	0.24807	1.3	0.194
Inf	-0.1714	0.05676	-3.02	0.003
Cons	0.088168	0.08309	1.06	0.289

Now we use the test with the NIM against bank profitability here common effect model , fixed effect model and random effect model will be used. After that we use the Haussmann test to select the best model the Haussmann show the p=0.9927 which says the random effect model accepted.

Here the size is negative but significant, cap is positive and significant, ce is negative and significant, lp is positive and significant, conc is positive and significant and the INF is negative bit its significant.

CONCLUSION AND RECOMMENDATIONS

We study to examine the determinants of the bank's profitability, inflation and cost efficiency, we select the 26 commercial banks over the period 2008 to 2012. We use banking specific

ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)

industry and select the data from the financial statement analysis which is published by the state bank of Pakistan. We used panel data analysis with totally 130 observations. Bank profitability is measured by two different variables ROA and NIM.

Our results show that the increasing their banking sector development and the lower the volume of the nontraditional activity and higher banking sector which tend to increase the profitability of the commercial banks of Pakistan.

Here we find the effect of risk and bank profitability in the nature of ROA and NIM. Where the higher productivity seems to be more profitable in terms of ROA. Here the positive relationship between inflation and profitability of Pakistani commercial banks and the inflation in Pakistan is fully anticipated and interest rates should be adjusted accordingly to their profitability. The further implies that revenue increased faster than cost.

In summary the cost efficiency is provide by the ratio of the overhead expense over the total assets of the commercial banks.

Further research should be include other adequate variables and also the slack based model and use the new techniques for testing and measuring the efficiency of the banks. Considering large and small banks it denotes the profitability by branch to branch or location to location.

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