



Impact of Macroeconomics Variables and Ownership on Banks Profitability

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Abstract

The study aims to see the internal and macroeconomics variables on the profitability of commercial banks in Pakistan. Results of Study indicate that capital, size, GDP and inflation have positive significant impact on banks profitability. While loan loss provisions, deposits growth and interest expense have negative significant coefficients. Our results are robust and in accord with literature available on profitability of banks.

Abstract: Macroeconomics, variables, ownership, banks, profitability.

Introduction

Banks deal in money and are factories of credit. The Pakistani law defines banks as institutions that accept deposits of money from general public for the purpose of lending upon the conditions that such sums of money will be payable on demand or otherwise (banking company ordinance 1983). The recent financial crises in the major economy of the world undoubtedly indicate the fact that banks are one of the major pillars of economy. Thus there is a need to revisit factors that determinants the profitability of economy. The studies of Vernon¹⁻³ indicate that ownership plays a pivotal role in the profitability of the banks.

Ramlall, Cheang stresses the need to include loan loss provisions instead of loans to be a determinant of bank profitability^{4,5}. Sufian also is of the opinion that credit risk instead of credit should be used in determining of the profitability of bank⁶. Abren and Mendes; Bourke are of the argues that advocate capital with banks is the first line of defense against any risk face by the firm^{7,8}.

This school of thought therefore advocating the precision of significance capital will be a guarantee of bank profitability. Banks do not operate in the box and these are heavily impacted by macro economics variables Such as GDP^{9,10} higher GDP has a hall mark of increased industrial output that interns impact bank profitability. The macro economics variables of inflation and bank discounts rate have also been considered as important macro economics determinant of bank profitability. Heggstedt found out that inflation has a negative significant impact on banks profitability while Guru et al.; Jiang et al. indicates that inflation increases the profitability of banks^{11,12}. To see whether such relationship exists in the context of developing countries like Pakistan, we will conduct this study by augment the list of variables with interest expense and deposits growth.

Literature Review: Banks are firms that deal in money and earn their profit by advancing loans to firms and masses. (Banking and finance). The recent crash of US economy

started in 2007 reignited the needed to study the determinant profitability of banks. Many of the recent studies had examined the profitability's of bank on internal and external distensions¹³⁻¹⁵. In the study conducted by Bourke indicates that profitability and capital advocacy are highly correlated further Naceur and Goaid found a moments relationship between capital advocacy and profitability¹⁶⁻¹⁸. In nutshell their studies confirmed that profitability is increased under the umbrella of advocate capital. The internal variable of size also has momentous positive relationship between size and profitability of banks. The study of Pasiouras and Kosmidou and Sinky are of the indicates that larger size greatly impact the profitability of the of banks^{19,20}. The study of Boyd and Runkle indicated that large size banks tend to earn lower profit²¹. The same results also obtain by Miller and Noulas²². further Micco et al. indicates that size and profitability are uncorrelated²³. Loan loss provisions signifies the risk associated with loan extended by the bank Ramlall⁹. the higher this ratio, higher will be the loss experience by the bank. it's preferable to take LLP (loan loss provisions) as determinant of banks profitability for the reason that just advancing huge loans is not the guarantee of profit :

the formation of the interest rate is more moderate and tends in the direction of market determined²⁴. Ali et al indicate in his study about the commercial banks of Pakistan by using the sample of 28 banks, period of (2006-2009), size of the bank and credit risk has significant positive relationship²⁵. The loans expense rate or interest rate depend on inflation rate. In Iran banks present Different types of loans with high interest rates. January 2012 in Iran government banks lending rates up to 15%, and 20% interest rate charge by the private banks in some cases²⁶.

Due to economic collapse many borrows may lose jobs and not able to pay back loans punctually²⁷. Gupta et al and Das et. Al small banks are the cause of increase in efficiency of the private banks²⁸

Vong and Chan the effect of ownership has been estimated by

using different dimension of ownership philosophy. it was examined by Vernon (1971) that greater profitability achieved when the banks was controlled by professional managers rather than owners. The study has further omitted by Mullineaux and short^{4,6}. the further divided the banks into holding company bank banks and multi holding company bank banks to posit that bank holding company bank earned more profit. Whereas short divided banks on basis of government and non government ownership banks to conclude that government banks were less profitable as compare to non government banks⁶Inflation has attracted a mixed reaction from the researchers working on banks profitability.

Hoggarth suggest that higer inflation leads to lower profitability. He compliments the working of Heggsted who was the of opinion that inflation makes its difficult for borrowers to pay back their loans. Thus causing losses for the bank. However research Guru *et al.* ; Abreu and Mendes are of the opinion that inflation reduces the profitability of banks . Growth in gross domestic product is an external variable that has proven to impact on profitability of banks. Increase in GDP leads to increase in industrial activity in the country and thus more and more loans are taken by corporation to get advantage of booming economy.

Albertazzi and Gambacorta Athanasoglou et al confirming the fact that gdp impacts the profitability of banks in their study conducted on panel of Greek banks. To see whether all the above mentioned factors play a moment's role in determining the gdp of Pakistani banks, we will conduct this study.

Methodology

Data: For the variables used in our study will be obtained from financial statement analysis issued by SBP. The source was selected because the data published by central bank of country and is highly reliable. The variables for macroeconomics indicators are obtain from ifs cd room issued by international monetary firm imf. The sample period was from (2008 to 2012) the period is significant because during this time period the Pakistani economy has under gone from almost all phases of economic cycle.

We have selected 31 banks that includes some foreign banks these banks are operational in Pakistan and are competing with local commercial banks of the country .those banks whose data was unavailable for sample period of 2008 to 2012 are omitted. The estimation period is from 2009 to 2012 while 2008 has been used to obtain lacked of different measures used in study.

Regression model: The following base line regression model will be estimated in the context of Pakistani banks

$$ROA_{i,t} = \alpha_0 + \beta_1 Cap_{i,t} + \beta_2 llp_{i,t} + \beta_3 DepGR_{i,t} + \beta_4 Size_{i,t} + \beta_5 Intexp_{i,t} + \beta_6 GDP_{i,t} + \beta_7 INF_{i,t} + year\ effect + \mu_{i,t}$$

Variables and Calculations: Where "cap" represents capital

adueqacy ratio of the bank and is calculated as total equity of the bank divided by the total assets. Llp is Loan loss provisions that are the provisions against advances divided by total assets. DepGR is Deposits growth that is the deposits of current year divided by deposits of previous year minus one. Size is the natural log of total asset of the bank. Intexp is the interest expense measured as the interest expense divided by average deposits of the bank. GDP is the real gdp of Pakistan obtained from IFS cd room . Inf represents inflation in Pakistan obtained from IFS cd room.

Panel data analysis: We will conduct panel data analysis using common effect model, fixed effect model, and random effect model.

Common effect model: It assumes that all cross sectional entities are homogenous in nature. Following common effect model will be estimated.

$$[[ROA]]_{(i,t)} = \alpha_0 + \beta_1 [[Cap]]_{(i,t)} + \beta_2 [[llp]]_{(i,t)} + \beta_3 [[DepGR]]_{(i,t)} + \beta_4 [[Size]]_{(i,t)} + \beta_5 [[Intexp]]_{(i,t)} + \beta_6 [[GDP]]_{(i,t)} + \beta_7 [[INF]]_{(i,t)} + year\ effect + \mu_{(i,t)}$$

Serious disadvantage of this method is the assumption of homogeneity thus we will not be in position to give greater generalizable results using common effect model.

Fixed effect model: Its powerful estimation technique that allows for heterogeneity of cross sectional entities. The following fixed effect model will be estimated in our study

$$ROA_{i,t} = \alpha_i + \beta_1 Cap_{i,t} + \beta_2 llp_{i,t} + \beta_3 DepGR_{i,t} + \beta_4 Size_{i,t} + \beta_5 Intexp_{i,t} + \beta_6 GDP_{i,t} + \beta_7 INF_{i,t} + year\ effect + \mu_{i,t}$$

This model allows for heterogeneity of cross sectional variables by having a unique intercept and also allows to control biases that may arise due to homered variables.

Random effect model: This model is also a very powerful estimation technique in panel data analysis. It control for the errors cost by the error term the following random effect model will be used for our estimation.

$$ROA_{i,t} = \alpha_0 + \beta_1 Cap_{i,t} + \beta_2 llp_{i,t} + \beta_3 DepGR_{i,t} + \beta_4 Size_{i,t} + \beta_5 Intexp_{i,t} + \beta_6 GDP_{i,t} + \beta_7 INF_{i,t} + year\ effect + \mu_{i,t}$$

The results of fixed effect model and random effect model are highly generalizable.

Hausmann test: Sometime due to large observation and limited time period, fixed and random effect model differ in their results .thus in order to select the best model we will conduct houseman test after conducting fixed and random effect models under the following hypothesis.

H1: fixed effect results are accepted, H0: Random effect results are accepted, P value of .05 or less enables us to select fixed effect model and vice versa.

Heteroskedasticity Test: The presences of out layer are common phenomena in almost all panel data analysis thus we will also conduct heteroskedasticity test using Breusch-Pagan / Cook-Weisberg test for heteroskedasticity.

Test for heterodastic under the following hypothesis: H1: Data is heteroskedastic, H0: Data is not heteroskedastic.

Results and Discussion

Table-1
Descriptive Statistics

Variables	obs	Mean	Std. Dev.
Roa	124	0.002395	0.021623
Cap	124	0.147754	0.242366
Llp	124	0.050294	0.09056
Depo	124	0.237958	0.309648
Size	124	18.56575	1.279528
Intexp	124	0.081873	0.031984
Ownership	124	0.129032	0.336596
Gdp	124	0.207949	0.122328
Inf	124	0.122827	0.016876

Table-1 represents descriptive statistics of our variables. The return on assets (ROA) has mean value of 2% while capital adequacy ratio has a mean of 14%. Further the deposits are growing at the rate of 23%. This clearly indicates that despite of impressive deposit growth, the profit rate is very low.

Correlation: Table-2, Represents the correlation matrix for our variables

The correlation matrix clearly indicates that there is no significant correlation among our independent variables. Thus

our estimations will be free from the problems of multi collinearity.

Regression Results: The Common Effect Model with Standard errors (reported in TABLE 4) indicates that capital, gdp, size and inflation positive significant impact on banks profitability while loan loss provisions, Deposits growth, interest expense has negative significant impact on banks profitability. However ownership is insignificant. In order to see whether there is heterodastic in our data .we will conduct Breusch-Pagan / Cook-Weisberg test.

Breusch-Pagan / Cook-Weisberg test for heteroskedasti city

Ho: Constant variance, Variables: fitted values of roe, chi2 (1) = **16.17**, Prob > chi2 = **0.0001**

The hetroskadisky test has revled that our data has out layers (p value= .0001<.05). Thus from this point on words we will conduct all tests using robust standard errors.

Table-3 represents Common, Fixed and random effect models with robust standard errors. The fixed effect model indicates that capital, size, inflation have positive significant impact while loan loss provisions, deposit growth have negative significant impact. Fixed effect model also indicates that interest expense and gdp have insignificant impact on profitability,

The random effect model indicates that capital, gdp, and inflation, size are positive and significant.

These results clearly indicate that the results of fixed effect and random effect model differ from one another. Thus to debate on the results, we will conduct Haussmann test to identify the correct model that will provide us with generalizable results.

The houseman test (table-5) revels p value of 0.2025.thus we will admit the outcome of random effect model.

Table-2
Correlation Matrix

	Roa	Cap	Llp	Depo	Size	Intexp	Ownership	Gdp	Inf
Roa	1								
Cap	0.1512	1							
Llp	0.0127	0.4558	1						
Depo	-0.2865	-0.0102	-0.0476	1					
Size	0.3359	-0.3145	0.0272	-0.231	1				
Intexp	-0.4589	0.1107	0.0349	-0.0267	-0.3478	1			
Ownership	0.2105	0.1878	-0.1265	-0.1666	-0.4018	-0.0238	1		
Gdp	0.2859	0.0922	0.0929	-0.1039	0.1201	-0.057	0	1	
Inf	-0.2171	-0.1245	-0.1179	0.1135	-0.0994	0.0684	0	-0.4375	1

Table-3
Regression Results

Common Effect Model						
	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
Roa						
Cap	0.0781168	0.0144356	5.41	0	0.0495227	0.106711
Llp	-0.1656676	0.0374555	-4.42	0	-0.2398596	-0.09148
Depo	-0.0122351	0.0052246	-2.34	0.021	-0.022584	-0.00189
Size	0.0082752	0.0014597	5.67	0	0.0053839	0.011167
Intexp	-0.2420992	0.065785	-3.68	0	-0.3724066	-0.11179
Ownership	0.0075385	0.0050903	1.48	0.141	-0.0025444	0.017621
Gdp	0.0718423	0.0239525	3	0.003	0.024397	0.119288
Inf	0.338172	0.1620079	2.09	0.039	0.0172656	0.659079
_cons	-1.668181	0.5082278	-3.28	0.001	-2.674882	-0.66148
Fixed Effect Model						
	Coe f.	Robust Std. Err.	T	P> t	[95% Conf. Interval]	[95% Conf. Interval]
Roa						
Cap	0.1086885	0.0237858	4.57	0	0.0614039	0.155973
Llp	-0.1424581	0.052396	-2.72	0.008	-0.2466178	-0.0383
Depo	-0.0127332	0.0035153	-3.62	0	-0.0197213	-0.00575
Size	0.0354109	0.0067681	5.23	0	0.0219564	0.048866
Intexp	-0.1299188	0.0861104	-1.51	0.135	-0.3011005	0.041263
Ownership	(dropped)					
Gdp	0.0348585	0.0209632	1.66	0.1	-0.0068149	0.076532
Inf	0.3605637	0.1177066	3.06	0.003	0.1265708	0.594557
_cons	-1.41943	0.3941961	-3.6	0.001	-2.203066	-0.63579
Random Effect Model						
	Coef.	Robust Std. Err.	Z	P> z	[95% Conf. Interval]	[95% Conf. Interval]
Roa						
Cap	0.0786064	0.020257	3.88	0	0.0389034	0.118309
Llp	-0.1580009	0.0521492	-3.03	0.002	-0.2602114	-0.05579
Depo	-0.0108255	0.0041249	-2.62	0.009	-0.0189101	-0.00274
Size	0.0100131	0.0018527	5.4	0	0.006382	0.013644
Intexp	-0.1936906	0.0806479	-2.4	0.016	-0.3517576	-0.03562
Ownership	0.0107133	0.0074192	1.44	0.149	-0.0038281	0.025255
Gdp	0.0693395	0.0191949	3.61	0	0.0317182	0.106961
Inf	0.3316774	0.122909	2.7	0.007	0.0907802	0.572575
_cons	-1.65277	0.4024373	-4.11	0	-2.441533	-0.86401

Random effect model estimation clearly indicates that capital adequacy has a significant and positive impact on the profitability of firms. This indicates that the banks with higher capital adequacy tend to be safer and can survive economic crisis and remain profitable. The size of the bank is significantly impacting the profitability. This is because the banks with larger size can have more diversified portfolio and thus can reduce the risk of loan loss. Further the bank with larger size enjoys the economy of scale and thus can minimize its cost of obtaining funds.

GDP shows significant and positive impact on bank's

profitability the reason for this impact is a high increase in GDP is followed by increase in industrial output and lesser default. Thus in the period of boom banks can maximize profit by advancing loans to industry at lower risk of default. Thus increasing its profitability inflation is also positive significant, the reason is that during inflation people generally take loans to gain the advantage of higher prices in the economy this maximize banks profitability.

The percentage of LLP indicates credit quality of the banks. Thus higher this ratio, lower will be the quality of the loans thus eroding the profits of the bank.

Deposit growth might anticipate that higher deposits will lead the profitability of the bank but as a matter of fact increase in deposits does not guaranty that. If increase in deposits are not utilize in a profitable loan portfolio than instead of adding to the profitability, it might erode it. Further in order to attract higher deposit, banks have to encore huge costs. In case of Pakistan deposits have significant but negative impact on banks effectiveness.

The bank has to pay for deposits it's trying to attract. It is the trade cost of the bank higher this interest expense, lower will be the profits of the banks. This indicates that whether the bank is of foreign origin or is registered locally; it will not be the factor of profitability in case of Pakistan.

Conclusion

The study of conducted by taking 31 banks of domestics and foreign origins with 124 firm-year observations for all the variables of the study. We accepted the results estimated by the

random effect model after it passed the houseman test. The results have positive significant coefficient for capital size GDP and inflation while negative significant coefficient for loan loss provisions, deposits growth and interest expense were obtained. The results clearly indicate that Pakistani banks maintaining adequate capital reserves were more profitable. Similarly large size banks were better off in gaining profits and fighting economic downturn. The macroeconomic variables of GDP and inflation indicate positive impact on banks gaining's. That stresses need on policy making to take step fasting GDP growth of country and maintaining inflation at except able level. Loan loss provisions, as expected, yield a negative significant impact on banks profitability. Deposits growth yield negative significant coefficient that indicates that Pakistani banks are not utilized their deposits profitability. This is a serious concern and state bank of Pakistan needs to setup in with polices to utilize those deposits in good loan portfolios. The interest expense as expected turn out to have negative significant impact on profitability. Further we found no prove of ownership impacting banks profitability.

Table-4
Common Effect Model with Standard Errors

Source	SS	Df	MS			
Model	.033715146	8	.004214393	Number of obs = 124		
Residual	.023794215	115	.000206906	F(8, 115) = 20.37		
total	.05750936	123	.000467556	Prob > F = 0.0000		
				R-squared = 0.5863		
				Adj R-squared = 0.5575		
				Root MSE = .01438		
Roa	Coef.	Std. Err.	t	P> t	95% Conf.	Interval
Cap	.0781168	.0118123	6.61	0.000	.054719	.1015146
Llp	-.1656676	.0300445	-5.51	0.000	-.2251799	-.1061552
depo	-.0122351	.0046104	-2.65	0.009	-.0213674	-.0031028
Size	.0082752	.0014345	5.77	0.000	.0054337	.0111167
Intexp	-.2420992	.0449211	-5.39	0.000	-.3310792	-.1531191
Ownership	.0075385	.0048419	1.56	0.122	-.0020525	.0171294
Gdp	.0718423	.023113	3.11	0.002	.0260599	.1176246
Inf	.338172	.168112	2.01	0.047	.0051745	.6711696
_cons	-1.668181	.4975221	3.35	0.001	-2.653676	-.6826852

Talbe-5
Hassman test

	Coefficients			
CAP	.1086885	.0786064	.0300821	.0124667
LLP	-.1424581	-.1580009	.0155428	.0050792
DEPO	-.0127332	-.0108255	-.0019076	.
SIZE	.0354109	.0100131	.0253978	.0065096
INTEXP	-.1299188	-.1936906	.0637718	.0301812
GDP	.0348585	.0693395	-.034481	.0084269
INF	.3605637	.3316774	.0288863	.

b = consistent under Ho and Ha; obtained from xtreg, B = inconsistent under Ho; obtained from xtreg, Test: Ho: difference in coefficients not systematic, $\chi^2(7) = (b-B)'[(V_b-V_B)^{-1}](b-B)$, = 9.76, Prob>chi2 = 0.2025, (V_b-V_B is not positive definite)

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