

Profitability Determinants of Commercial banks in Paksitan

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This study has been carried out with the aim to investigate the impact of the bank specific variables and macroeconomic indicators on the profitability of banks during the period of 2006- 2010. There are two measures of profitability Return on equity (ROE) & Return on assets (ROA). In order to find out the impact, the study tested the hypotheses that there is a significant impact of Asset size, Credit Risk, deposits to assets ratio and interest rate on ROE and there is a significant impact of credit risk, Operating efficiency and interest rate on the ROA. The data was collected from State Bank of Pakistan. All 32 commercial banks were selected and by using regression the results show that there is a significant impact of asset size, total deposits to total assets, credit risk and interest rate on ROE and credit risk and interest rate have also a significant impact on ROA.

Track: Finance & Banking

1. Introduction

In Pakistan the banking sector is comprised of commercial banks, Islamic banks, foreign banks, microfinance banks, DFIs and specialized banks. State Bank of Pakistan is the only regulatory & supervisory jurisdiction to monitor all the banks being operated in Pakistan. There are five banks in the Public sector, two specialized banks, seventeen private sector banks, six foreign banks, eight DFIs, five Islamic banks and seven microfinance banks in Pakistan. A progressive and well functioning banking sector is very important for the economic growth of the country and Profitability is essential for the well functioning banking sector, it supports to absorb losses resulting from the banking operations Therefore, it is important to understand those factors which have some affect on banks' profitability.

Pakistan's Banking sector has witnessed many changes since its independence and the role of this sector in economic development of the country is very significant. As compared to 2009, in 2010 the growth in the investments increased by 10.7%, for Pakistani banks the lending amount decreased by 33.5% and for foreign banks it increased by 28% and there was a decline in the advances of banks by 8.4%.

The non performing loans (NPL) increased by 445billions in 2010, in comparison of 305 billion in 2009.The ratio of NPL to advances increased by 13.7% from 8.6% in the year 2009.In 2010, as compared to 2009, pretax profit was declined by almost 5.2% and the

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amount was 50.9 billion in 2010 and 53.7 billion in 2009. The profit after tax was 47.9 billion in 2009 and 29.4 billion in 2010. In the year 2010, there was a decline in ROE and ROA. ROE was declined from 8.3% in 2009 to 5.9% in 2010 whereas ROA was 0.74% in 2009 and 0.48% in 2010. The spread ratio for the banks in Pakistan was decreased to 43.7% in 2010 as compared to 45.2% in 2009

This study has been carried out with the objective to investigate the impact of bank specific factors of commercial banks as well as macroeconomic indicators on the profitability in Pakistan during 2006 -2010. Usually the profitability of bank is gauged by ROE and ROA. In order to find out the impact the study tested the hypotheses that there is a significant impact of Asset size, Credit Risk, Total deposits to total assets and interest rate on the ROE and there is a significant impact of Credit Risk, Operating efficiency and interest rate on the ROA.

1.1 Problem Statement

The main objective is to find the impact of bank specific indicators such as: Asset size, Credit Risk, Total deposits to total assets ratio, and macroeconomic indicator such as: interest rate (Discount rate) on the profitability measures, ROE and ROA of commercial banks in Pakistan over the period 2006-2010.

1.2 Hypotheses

The study proposes the under mentioned hypotheses propositions:

H1: There is a significant impact of Asset size, Credit Risk, Total deposits to total assets and interest rate on ROE.

H2: There is a significant impact of Credit Risk and interest rate on ROA.

The above hypotheses have been based on the literature, Samy & Mahammad(2008) examined the impact of specific variables related to banks as well as macroeconomic indicators on the profitability and the financial structure's effect on banks' profitability in Tunisia from 1980 to 2000 period. Panayiotis, Sophocles &, Matthaios (2008), investigated the influence of the determinants related to banks, industry and macroeconomic on the profitability of the banks in Greece during 1985-2001. Rajesh & Sakshi (2009) studied the impact of assets, advances deposits and macroeconomic indicators on the profitability of banks in India. Timothy & Robin (2009) investigated the correlation between small banks' profitability related to single market and the banks of large organization, which are operated in urban and rural markets in USA during the period of 1996 to 2003. Fadzlan & Muzafar (2009) studied the influence of bank's internal factors & macroeconomic indicators on the profitability of commercial bank in China during 2000-2005. Hong & John (2010) studied the determinants of profitability of banks with different ownership structures in Japan during 2000 to 2007. Fadzlan Sufian (2010) studied banks' internal factors and macroeconomic indicators' influence on the banks' profitability in Thailand during the period 1999 to 2005. Deger & Adem (2011)

studied the influence of internal factors of bank and macroeconomic indicators on commercial banks' profitability in Turkey during 2002 - 2010.

2. Literature Review

Hong and John (2010) studied the determinants of profitability of banks with different ownership structures in Japan during 2000 to 2007 and found that there is positive correlation between capital adequacy ratio profitability and negative relationship between capital adequacy and Net interest margin (NIM) in the banks of Shinkin and city. It was analyzed that there is negative impact of Market share on the regional banks whereas there is a positive influence on the banks of Shinkin. Banks of credit cooperative in Japan has also positive influence of market share. GDP growth (real) increases competition among banks and may result in decrease of profits. The development of Stock market has negative influence on the profitability of banks other than banks of city and trust in Japan. Shinkin banks have the ability to maintain profit persistence as compared to the other credit cooperatives which has not much ability to maintain the profits.

Samy & Mahammad (2008) examined the impact of specific variables related to commercial banks of Tunisia as well as macroeconomic indicators on the profitability and financial structure's effect on banking sector's profitability in Tunisia from 1980 to 2000 period. Capital adequacy ratio has positive effect on profitability and there is negative impact of size on profitability. There is no impact of macroeconomic indicators on bank's profitability in Tunisia. The development in the stock market has positive impact on profitability, since Tunisian banks have extended their earnings through the revenues, earned from the intermediation and the management of portfolio of stock market compensates the reduced margin to compare the ownership structure it was found that private banks perform better as compared to state owned banks. There is a negative impact of liberalization on interest margin and positive impact of complete liberalization of banks in Tunisia.

Toni (2009) investigated the influence of corruption on the Nigerian banks' profitability during 1996 to 2006, and found that corruption has positive impact on the bank profitability.

Timothy & Robin (2009) investigated the correlation between small banks' profitability related to single market and the banks of large organization, which are operated in urban and rural markets in USA during the period of 1996 to 2003. The bank of single market is defined as bank having total assets of at least one billion and which is not an auxiliary of a holding company of multi-bank and at least generates minimum 90% of deposits by the bank of single local market and the bank of outside the less than thirty percent of deposits is derived. The large or big banks are those having more than or equal to one billion total banking assets. Local markets are urban markets whereas others are rural markets(out of market) they concluded that small banks, related to the single market, have positive relationship of the profitability with both small & large

banks which are out of the market on the other hand there is no significant relationship in the rural market.

Rajesh and Sakshi (2009) investigated the influence of bank characteristics and macroeconomic indicators on the profitability of Indian public private and foreign banks during 2001 to 2007 and concluded after regression analysis that investments have positive impact, per capita income and index of industrial production have also positive impact, wholesale price index, exports as well as foreign exchange reserves have also positive impact on the operating profit of public sector, private sector and foreign banks whereas the advances, deposits as well as assets have no impact on public sector's banks' profitability and there is a positive impact on private sector and foreign banks' profitability.

Fadzlan & Muzaffar (2009) studied the influence of bank's internal factors and macroeconomic indicators on profitability of banks in China including all joint stock (JSCBs) commercial banks, state owned (SOCBs) and city commercial banks during 2000 to 2005. The findings revealed that liquidity has the positive influence and there is also a positive influence of capitalization and credit risk on the profitability of State owned banks. On commercial banks of joint stock the influence of cost on the profitability is negative. But in the case commercial banks of city the influence of size is negative and the impact of costs is also negative. Diversification impact is positive. The economic growth's influence is positive and there is a negative influence of money supply growth on profitability of the state owned and city commercial banks in China.

Deger and Adem (2011) studied the impact of specific variables related to commercial banks as well as macroeconomic indicators on the profitability on 10 listed commercial banks (in Istanbul stock exchange) in Turkey from 2002 to 2010 and results of the study shows a positive impact of size of asset and non-interest income. (Income-Expenditure Structure) where as size and credit portfolio's influence on the profitability is negative and interest rate (real) has positive influence on the banks' profitability in Turkey.

Panayiotis, Sophocles and Mattaios (2006) investigated the influence of bank's internal factors, industry related factors and indicators related to macro economy on the profitability of banks in Greek during 1985-2001. By using GMM technique, the estimated results showed that capital, credit risk, operating exp management, inflation and productivity growth, business cycle (cyclical output) have the positive as well significant influence on the banks' profitability where as there is a negative influence of size on the profitability.

Andreas and Gabrielle (2010) studied the impact of profitability determinants (banks specific industry specific, macroeconomic) before and during the crisis in Switzerland from 1999 to 2009 for 372 commercial banks. From 1999-2006 was considered the pre-crisis period and from 2007-2009 was considered crisis years, Averages of ROE, ROA and Net interest margin have been used as profitability measures whereas average values are used to capture the changes during the year. By using GMM estimator technique it was concluded that competent banks show high profitability as compared to

less competent banks, the growth in loan volume, which is above the average, affects positively on the profitability. There is a negative impact of higher funding costs and diversification has the positive impact on profitability.

Fadzlan (2010) studied the influence of bank's internal factors and macroeconomic determinants on the Korean banks' profitability during 1994 to 2008. The period can be divided into 4 sub-periods: the first period is tranquil period (1994-1996) which is before the financial crisis in Asia. Second period is from 1997 to 1998 and called Asian financial crisis then the tranquil period which is in between Asian Financial crisis and financial crisis (1999-2008) After the regression analysis it was concluded that both Asian financial and global financial crisis have negative impact on profitability, while during tranquil periods the banks are more profitable but credit risk has negative influence on profitability. Capitalization shows a positive impact during the both financial crisis (Asian & Global) as well as tranquil periods. The business cycle effect is mixed; inflation shows pro-cyclical effect, whereas GDP shows counter-cyclical impact on banks' profitability. There is a positive and significant influence of National banking system's Industry concentration on the Korean banks profitability.

Alton and David (2007) measured the profitability of different banks and concluded that usefulness of the measures of profitability can be influenced by the laws set by the tax law authorities, since the banks' earnings, which operates under sub-chapters, taxes are exempted on their income, on the contrary on the stockholders of those "S banks" taxes are levied on their proportionate investment share of the bank's income .corporations which are not elected as 'S' status operated under the federal tax code's sub-chapter "C". Generally the income after deduction of taxes of "S" banks are higher as compared to commercial banks(C banks). The growth in the sub-chapter "S" has influenced the usefulness of profitability measures (ROA & ROE) and stressed on pretax earnings measures to gauge the profitability of banking sector but there is not any findings of this study to show that any specific profitability measure is better for the profitability comparison among banks. it also shows the caution that which profit measures should be used by analysts.

Fadzlan (2011) studied the influence of bank's internal factors and macroeconomic indicators on the Korean banks' profitability during 1992 to 2003. On the basis of regression it was concluded that liquidity has negative impact on profitability banks with lower liquidity level to show higher profitability. Diversification regarding banks' income sources has positive impact on profitability. Credit risk has negative impact. Business cycle particularly inflation shows pro-cyclical impact on bank profitability size has positive impact on the profitability where as there is a negative influence of financial crisis in the Asia on the Korean banks, Korean banks showed more profitability during the period of pre-crisis than the post crisis period.

Hiroshi and Yuan (2010) investigated the impact of monetary policy on lending of bank on characteristics basis of Chinese banks during 1985 to 2007. After analysis by GMM estimator it was concluded there is a weak influence of monetary policy for large banks and banks having low liquidity. It was also concluded that for banks with high profitability

there is a small impact of monetary policy, since the strategy of tightening monetary policy causes fall in the deposits but banks with high profitability tends to finance this shortage easily as compared to banks with less profitability, which have to bear high cost of capital.

Dennis and Taisier (2011) compared accounting profitability measures with the economic determinants in the ten countries of Middle East and MENA during the period of 2000 to 2008. Accounting profitability is ROA and ROE and economic determinants are cost and profit efficiencies9 ratio of net income and provisions for loan losses). It was concluded that bank size has positive impact on the bank's Accounting measures of profitability .the banks of MENA shows high profitability and do not show much contradiction between the cost and profit efficiency although they are smaller in size. If these banks were larger, would be more efficient in terms of cost & profit. It was also concluded that there is negative impact of Cost efficiency on the profitability. MENA banks are less efficient in terms of cost efficiency than the European banks but MENA banks are similar to the banks in the developing countries.

Fadzlan (2010) studied the bank internal factors and Macroeconomic indicators' impact on the Accounting measures for profitability (ROA and ROE) for the banks in Thailand during 1999 to 2005, which is the period of post financial crisis in Asia. After regression analysis it was concluded that size and capitalization has positive impact on profitability where are non-interest income, credit risk and overhead costs have negative relationship with profitability of banks credit risk has negative impact on ROA but positive impact on ROE. There is positive impact of higher economic growth and inflation on the banks in Thailand but per capita GDP has negative impact on the profitability.

3. Research Methods

This chapter includes Method of data collection, sampling technique, sampling size, explanation of the dependent and independent variables, modal development and statistical test used for this study.

3.1 Method of Data Collection

All the commercial banks' data is collected over the period of 2006-2010, consisting of 141 observations. The data of Bank specific variables is derived from the publications of State bank of Pakistan, regarding macroeconomic variables the data has also been obtained from the publications of State bank of Pakistan.

3.2 Sampling Technique

The sample unit in this research is commercial banks of Pakistan and data is collected from all commercial banks which includes 32 banks during the period of 2006-2010.

3.3 Sample Size

Currently, there are 32 commercial banks in Pakistan excluding DFIs, micro finance and specialized banks. All 32 banks have been included in the sample, which include the banks in the Public sector, Private sector, Foreign and Islamic banks.

3.4 Explanation of the Variables

For the empirical analysis ten variables have been included, out of them; two variables (ROE & ROA) are dependent and four variables are independent and four are control variables. The independent variables and control variables include bank-specific and macroeconomic determinants. Previous studies support that profitability is measured by Return on Equity(ROE) and Return on Assets(ROA).(Fadzlan & Habibullah,2009; Panayiotis , Sophocles & Matthaios, 2008; Deger & Adem ,2011; Timothy & Robin,2009;Andreas & Gabrielle ,2011). The variables are defined as follows:

Return on equity (ROE): ROE is calculated as net profit divided by stockholders' equity.

Return on assets (ROA): ROA shows how efficiently assets are managed by the banks to generate profits. ROA is calculated as net profit divided by total assets.

Asset size (LNTA): Total assets of the banks are used to represent the bank size by taking natural logarithm of total asset.

Credit Risk (Cr): CR is calculated as total loss provision divided by total loans. Theory suggests that increase in credit risk is associated with the decrease in profitability.

Total deposits to total assets (TD/TA): The Deposits are an important source for banks funding. Increase in the deposits transformation into loans also increases the interest margin and profit. Deger & Adem (2011).

Interest rate (IR): Interest rates effect on the bank's profitability and Discount rate has been used for analysis.

Control Variable: There are some other bank specific and macroeconomic factors which can somewhat impact on the profitability of banks. Hence, we have included the following control variables in the study:

Operating efficiency (OE): It is calculated as total operating expenses divided by net interest income.

Total loan to total assets (TL/TA): It measures the source of income for banks.

GDP growth rate (GDP): It measures the growth in the economic activities after adjustment of inflation.

Consumer price Inflation rate (CPI): It measures the increase in the overall percentage in Consumer Price Index (CPI) for all goods and services.

3.5 Model Development

This study used multiple regression analysis technique to test the hypotheses. This shows the influence of independent variables on dependent variable. The majority of studies on bank profitability support the regression model to estimate the influence of different factors on the profitability. (Rajesh, 2009; Fadzlan & Habibuhhal, 2009; Panayiotis, Sophocles & Matthaïos, 2008; Deger & Adem, 2011; Andreas & Gabrielle, 2011). Therefore the following model has been constructed:

$$\text{Prof}_{it} = \beta_1 \text{LNTA}_{it} + \beta_2 \text{CR}_{it} + \beta_3 \text{OE}_{it} + \beta_4 \text{TD/TA}_{it} + \beta_5 \text{TL/TA}_{it} + \beta_6 \text{GDP}_t + \beta_7 \text{CPI}_t + \beta_8 \text{IR}_t + \varepsilon$$

Where

i=individual bank

t= year

β_i are co-efficient of regression

Prof: Profitability measured by ROE & ROA

LNTA: Asset size (logarithm of total assets)

CR: Credit Risk (total loss provisions to total loans)

OE: Operating efficiency (total operating expenses to net interest income)

TD/TA: Total deposits to total assets

TL/TA: Total loan to total assets

GDP: Annual real GDP growth rate

CPI: Consumer price Inflation rate

IR: Interest rate

3.6 Statistical Technique

To test the null hypothesis of the study, Regression analysis has been carried out and the following transformations have been used to make the variables' data linear because if data is analyzed without those transformations then observations are shown dispersed on the graph.

Log of total assets: \ln -total assets

Reciprocal of total deposits to total assets: rec-TD to TA

Difference of inflation rate: $\text{DIFF (inflation rate)}$

Log of ROA: \ln ROA

4. Results

4.1 Findings and Interpretation of the Results

In the regression analysis by using enter method the following results have been drawn.

Table 4.1: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.715 ^a	.511	.481	.10396

a. Predictors: (Constant), interest_rate, In_Total_Assets, GDP_growth_rate, Credit_Risk, O_E, DIFF_inflation, TL_TA, rec_TD_TA

b. Dependent Variable: ROE

If ROE is taken as dependent variable the above model summary table 4.1 shows that at 0.05 significance level, using all the predictors simultaneously the adjusted R² is 48.1%, meaning that 48.1% of the variance in profitability can be predicted by the independent variables.

Table 4.2: ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.459	8	.182	16.878	.000 ^a
	Residual	1.394	129	.011		
	Total	2.854	137			

a. Predictors: (Constant), interest_rate, In_Total_Assets, GDP_growth_rate, Credit Risk, O_E, DIFF_inflation, TL_TA, rec_TD_TA

b. Dependent Variable: ROE

The above Anova table 4.2 shows that the value of F is 16.8 and is significant. This indicates that the combination of the predictors significantly ($P < 0.05$) predict the profitability.

Table 4.3:

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.025	.159		-6.458	.000		
	ln_Total_Assets	.054	.007	.702	8.016	.000	.493	2.027
	Credit_Risk	-.347	.084	-.266	-4.158	.000	.922	1.084
	O_E	-.003	.001	-.143	-2.119	.036	.829	1.206
	rec_TD_TA	.087	.016	.533	5.318	.000	.377	2.654
	TL_TA	.198	.095	.193	2.090	.039	.446	2.240
	GDP_growth_rate	.004	.007	.035	.545	.587	.926	1.080
	DIFF_inflation	-.002	.001	-.155	-2.298	.023	.835	1.198
	interest rate	-.013	.004	-.195	-2.942	.004	.862	1.160

a. Dependent variable ROE

The above table 4.3 shows that in the analysis, when all independent and control variables are included, Ln of total assets, Total deposits to total assets ratio, credit risk, Total liabilities to total assets ratio, operating efficiency, interest rate and inflation rate are significantly related to ROE since their significance values are less than 0.05. The next important part is to check the tolerance and VIF values for the existence of multi-collinearity. In this analysis there is no multi-collinearity exists. So the variables are significant and collinearity does not seem to be an issue here among predictor variables. Beta values show that credit risk, O.E and interest rate and inflation rate are negatively correlated with the ROE and Ln total assets, T.D to T.A GDP growth and T.L to T.A are positively correlated with the ROE. It provides the following empirical model:

$$\text{ROE} = -1.025 + 0.702\text{LNTA} - 0.266\text{CR} - 0.143\text{OE} + 0.533\text{recTD/TA} + 0.193\text{TL/TA} - 0.155\text{diff_IR} - 0.195\text{IR}$$

Table 4.4: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.341 ^a	.117	.071	.86059

a. Predictors: (Constant), interest_rate, O_E, GDP_growth_rate, Credit_Risk, DIFF_inflation

b. Dependent Variable: ln_ROA

The above model summary table 4.4 shows that by using the ln ROA, to make the data linear log of ROA has been taken, as dependent variable the adjusted R² is 7.1% which means that 7.1% of the variance can be predicted by independent variables. In this analysis we have excluded the ln total assets, TD to TA and TL to TA because their effect will eliminate with ROA as dependent variable.

Table 4.5: ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.572	5	1.914	2.585	.031 ^a
	Residual	72.580	98	.741		
	Total	82.152	103			

a. Predictors: (Constant), interest_rate, O_E, GDP_growth_rate, Credit_Risk, DIFF_inflation

b. Dependent Variable: ln_ROA

The above Anova table 4.5 shows that the value of F is 2.5 and is significant at 0.05 (P<0.05) significance level which indicates that the combination of the predictors significantly predict the ROA.

Table 4.6:

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-3.661	.663		-5.525	.000		
	Credit_Risk	1.671	.909	.187	1.839	.069	.871	1.148
	O_E	.034	.019	.176	1.761	.081	.903	1.107
	GDP_growth_rate	.067	.065	.101	1.033	.304	.936	1.068
	DIFF_inflation	.000	.009	-.003	-.031	.975	.815	1.227
	interest_rate	-.083	.043	-.204	-1.960	.053	.828	1.208

a. Dependent variable: Ln_ROA

The above table 4.6 shows that interest rate is significant at 5% significance level and credit risk and operating efficiency are significant at 10% significance level. Beta values show that inflation rate and interest rate have negative relation with Ln ROA and credit risk and operating efficiency and GDP growth have positive relationship with Ln ROA. VIF and tolerance are acceptable show that there is no multi-co linearity. It provides the following empirical model:

$$\text{Ln ROA} = -3.661 + 0.187\text{CR} + 0.176\text{OE} - 0.204\text{IR}$$

The similar results have been found in literature, Rajesh and Sakshi (2009) found the significant impact of Asset size and inflation on the profitability. It has also found in the study that there is a significant impact of asset size on the ROE and CP inflation has also significant impact on ROE. Fadzman & Muzaffar (2009) also found the significant impact of Credit risk on the profitability. It has also found that there is a significant impact of credit risk on ROE. Deger and Adem (2011) found significant impact of asset size and real interest rate on the profitability. In this study significant impact on interest rate on ROE and ROA have also found. Panayiotis, Sophocles and Mattaios (2006) found that the inflation rate and the credit risk have significant influence on the profitability of banks.

4.2 Hypotheses Assessment Summary

The hypotheses summary is as follows:

Hypotheses	ROE	ROA
There is a significant impact of Asset size on profitability	Accepted	-----
There is a significant impact of Credit Risk on profitability	Accepted	Accepted
There is a significant impact of Total deposits to total assets on profitability	Accepted	-----
There is a significant impact of interest rate on profitability	Accepted	Accepted

5. Conclusion

This study examined the impact of bank specific indicators such as: Asset size (logarithm of total assets), Credit Risk, Total deposits to total assets ratio and macroeconomic indicators such as: interest rate, on the commercial banks' profitability in Pakistan from 2006 to 2010. The regression results show that when ROE is taken as dependent variable credit risk, interest rate (discount rate), total assets and TD to T.A have significant impact on ROE. When ROA is taken as dependent variable it is found that the credit risk as well as interest rate also have a significant influence on the commercial banks' profitability in Pakistan. These results are different because the banks in the Public sector, Private sector as well as Foreign Banks and Islamic banks, have different sizes and market shares due to this reason these banks' generates different levels of profits.

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