DETERMINANTS OF BANK PROFITABILITY IN PAKISTAN: INTERNAL FACTOR ANALYSIS

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ABSTRACT

Financial sector plays a pivotal role in the economic development. It is generally agreed that a strong and healthy banking system is a prerequisite for sustainable economic growth. Banks in Pakistan have been undergoing major challenges in the dynamic environment over the past few years. In order to resist negative shocks and maintain financial stability, it is important to identify the determinants that mostly influence the overall performance of banks in Pakistan. This study aims to give the analysis of the determinants of top 10 banks' profitability in Pakistan over the period 2004-2008. The focus is on the internal factors only. This paper uses the pooled Ordinary Least Square (POLS) method to investigate the impact of assets, loans, equity, and deposits on one of the major profitability indicator return on asset (ROA). The empirical results have found strong evidence that these variables have a strong influence on the profitability. However, the results show that higher total assets may not necessarily lead to higher profits due to diseconomies of scales. Also, higher loans contribute towards profitability but their impact is not significant. Equity and Deposits have significant impact on profitability.

Key words: Financial Institutions, Banks, Profitability, Return on Assets, Correlation, Pooled OLS, Pakistan.

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1. Introduction

Financial sector plays a pivotal role in the economic development. The financial sector in Pakistan comprises of Commercial Banks, Development Finance Institutions (DFIs), Microfinance Banks (MFBs), Non-banking Finance Companies (NBFCs) (leasing companies, Investment Banks, Discount Houses, Housing Finance Companies, Venture Capital Companies, Mutual Funds), Modarabas, Stock Exchange and Insurance Companies. Under the prevalent legislative structure the supervisory responsibilities in case of Banks, Development Finance Institutions (DFIs), and Microfinance Banks (MFBs) falls within legal ambit of State Bank of Pakistan while the rest of the financial institutions are monitored by other authorities such as Securities and Exchange Commission and Controller of Insurance (State Bank of Pakistan, 2009).

The financial system of Pakistan is dominated by the commercial banks. The structure of banking system in Pakistan underwent significant changes after 1997 when the banking supervision process was aligned with international best practices. Privatization of public sector banks and the ongoing process of merger/consolidation brought visible changes in the ownership, structure, and concentration in the banking sector. [1]

Structural, institutional, and macroeconomic aspects of financial system stability are receiving growing attention both nationally and internationally. The magnitude and mobility of international capital flows have made it increasingly important to strengthen the foundations of domestic financial system as a way to buildup flexibility to capital flow volatility. Thus the soundness of financial system, especially the banking system, is a key part of the infrastructure for strong macroeconomic and monetary policy performance at the national level.[2]

In banking terms, the determinants of profitability are well observed and explored but the definition of profitability differs in many studies. In past, researchers have tried to find out the determinants of profitability for banking sector, some researchers considered only the banking characteristics, whereas others included the financial structure and macroeconomic factors as well. In all these studies the contribution had been made in determining the factors that evaluate the profitability of the banks.

The objective of this paper is to examine Bank's profitability in the context of top 10 Pakistani banks, by using cross-national time series data from 2004-2008. The hypothesis of the study is:
  i.   To estimate whether there is a trade-off between total assets and Bank's profitability.
  ii.   To estimate whether there is a relationship between total deposits and total equity over bank's profitability.
  iii. To estimate whether loans contribute to banking profitability.

During the said period i.e., from 2004-2008 is very important in terms of mergers and acquisition in the banking industry. Therefore, this study focuses primarily on the internal factors of bank's profitability. Future research will carried out with some external factors on bank's profitability in Pakistan, which would assess the impact of South Asian Free Trade Agreements (SAFTA) and general globalization of markets on banking system. For this reason, top 10 banks have been selected for data collection in our research, as these banks covers almost 75% of the total asset base of overall banks in Pakistan. The factors considered for analysis include ROA as dependent variables and equity to total assets, loans to total assets, deposits to total assets and total assets have been taken as independent variables.

The paper is organized as follows: after introduction which is provided in Section 1 above, literature review is carried out in Section 2. Data and Methodological framework is explained in Section 3. Results are shown in Section 4. Final section concludes the study.

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[1] Pakistan Financial Sector Assessment 2003, State Bank of Pakistan.

[2] IMF , occasional paper 212, Washington DC 2002, *Financial soundness indicators: analytical aspects and country practices*

2. Literature review

This section provides the overview of previous studies reviewed related to the determinants of the profitability of banks. Some studies were country specific and few of them considered panel of countries for reviewing the determinants of profitability. Overall these studies propose that the determinants of profitability for bank can be divided into two groups; internal and external factors. These studies specify return on asset (ROA), return on equity (ROE) and net interest margin (NIM) as the dependent variables and considering the internal and external factors as independent variables.

The internal factors include capital ratio, credit risk, productivity growth and size of the bank. In the study of Bourke (1989), he found an important positive relation between the capital adequacy and profitability. He illustrated that higher the capital ratio, more the bank will be profitable. Demirguc-Kunt and Huizinga (1999) conduct a more comprehensive study which examines the determinants of banking performance for 80 countries, both developed and developing, during the period 1988-1995. They conclude that foreign banks have higher profitability than domestic banks in developing countries, while the opposite holds in developed countries. Nevertheless, their overall results show support for the positive relationship between the capital ratio and financial performance.

Another study by Abreu and Mendes (2002) on commercial bank interest margins and Profitability, for banks from four different EU countries for the period of 1986-1999 investigates the influences of bank-specific variables along with other variables on profitability of banks. They found that well-capitalized banks have low bankruptcy costs and higher interest margins on assets. Regarding bank-specific variables, the net interest margin reacts positively to operating costs and the loan-to-asset ratio has a positive impact on interest margins and profitability.

In his study of the determinants of the Tunisian banking industry profitability for 10 banks in Tunisia for the period 1980-2000, Naceur (2003) notices that high net interest margin and profitability are likely to be associated with banks with high amount of capital and large overheads. Further he also noticed that other determinants such as loans has positive and bank size has negative impact on profitability. Bashir and Hassan (2003) and Staikouras and Wood (2003) show that a higher loan ratio actually impacts profits negatively.

Goddard, et al. (2004) use panel and cross-sectional regressions to estimate growth and profit equations for a sample of banks for five European countries over the 1990s. The growth regressions suggest that, as banks become larger in relative terms, their growth performance tends to increase further, with little or no sign of mean reversion in growth. Berger (1987) finds positive causation in both direction between capital and profitability.

Another comparative study by Alkassim (2005) on the profitability of Islamic and conventional banking in GCC countries examines the profitability of Islamic and conventional banks in GCC countries over the period of 1997-2004. He considered, both internal and external factors as determinants of ROA, ROE and NIM, and suggested that asset quality of conventional banks is better than Islamic banks. And interest free lending relates to profitability in Islamic banks and total expenses affect conventional bank profitability negatively.

Another panel study by Athanasoglou *et al.* (2006,a) on determinants of bank profitability in the South eastern European region, considering the credit institutions for the period 1988-2002, suggested some implementation of the findings. They found that all bank specific determinants (the internal factors) have significant affect on bank's profitability. No positive result was found between banking reforms and profitability and macroeconomic determinants shows mixed affect. According to the research by Amor *et al.* (2006) on the commercial banks industry of the OECD (Organization for Economic Co-operation and Development) countries shows that a higher leverage ratio helps to get better profitability. Similarly, lower overheads ratio also improve profitability by reducing the type of costs, which is generally considered a signal of efficiency.

Athanasoglou *et al.* (2006,b) have done an empirical study to investigate the effect of bank-specific, Industry-specific and macroeconomic determinants on the profitability of Greek banks. It reveals that capital (ratio of equity to assets) is very important in explaining bank profitability and that increased exposure to credit risk lowers profits. Vong and Chan (2006) investigate the impact of internal and external factors of banks on the Macao Banking industry for 15-year period. Their results show that with greater capitalization, there is a low

risk and high profitability for the bank. Moreover, the large banking network attains higher profitability than the smaller banking network. They found that loan-losses provisions affect banks profitability unfavorably. Al-Haschimi (2007) studies the determinants of bank net interest rate margins in 10 SSA countries. He finds that credit risk and operating inefficiencies (which signal market power) explain most of the variation in net interest margins across the region. Macroeconomic risk has only limited effects on net interest margins in the study.

One of the recent IMF working papers on the Determinants of Commercial Bank Profitability in Sub-Saharan Africa by Flamini et al. (2009) used 389 banks as sample from 41 countries and shows that along with the credit risk, banks ROA are associated with larger bank size, further bank's returns are also affected by the macroeconomic determinants. An empirical study on Banks profitability in the kingdom of Saudi Arabia has been done by Masood et al. (2009), the study takes in co-integration approach over the period 1999-2007 to investigate the co-integration and causal relationship between ROA and ROE of Saudi banks.

Although, a lot of work has been carried out for the evolution of commercial banks efficiency in the world but very little work has been carried out on the banking sector of Pakistan. There are few studies which evaluate the performance of banking sectors in Pakistan. Ataullah et al. (2004) made a comparative analysis of commercial banks in India and Pakistan during 1988-1998. They found that the efficiency score in loan based model was much higher as compared to the income based model. Both countries banks have needed to improve their efficiency. Burki and Niazi (2006) analyzed the impact of financial reforms on the efficiency of state, private and foreign banks of Pakistan by using data of 40 banks for the period 1991-2000. They found a positive impact of banks size, interest income to earning assets and loans to deposit ratio on estimated efficiency scores.

The above discussion confirms a strong linkage between bank's profitability and internal factors. The paper addresses the gap in the literature by using challenging econometric techniques to testify the bank's profitability in terms of the individual country assessment case like Pakistan. In this study, country related specific shocks are absorbed and data are refined accordingly. According to the nature and purpose of each study mentioned in literature review, a number of explanatory variables have been proposed for internal determinants of bank's profitability. We have taken total assets, deposits, loans and equity to find the relationship with return on asset.

3. Data Source and Methodological Framework

The panel data set covers a 5-year period from 2004 to 2008, with a sample of 10 top banks of Pakistan (see appendix). The data were taken from the central bank of the country i.e., State bank of Pakistan, various reports. The basic estimation strategy is to pool the observations across banks and apply the regression analysis on the pooled sample. That is, a pooled OLS (POLS) equation will be estimated in the form of:

$$Y_{it} = \beta_0 + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + u_{it} \tag{1}$$

Where;

- Y_{it} = ROA represents Return on Asset for bank i at time t.
- $X1_{it}$ = Log (TA) represents natural logarithm of Total Asset for bank i at time t
- $X2_{it}$ = TE/TA represents ratio of Total Equity to Total Asset for bank i at time t
- $X3_{it}$ = TL/TA represents ratio of Total Loans to Total Asset for bank i at time t
- $X4_{it}$ = TD /TA represent ratio of Deposits to Total Assets for bank i at time t
- u_{it} = Error term.

The advantage of pooling is that more reliable estimates of the parameters in the model can be obtained. It is a valid procedure where the relationship between the variables is stable across cross-section units. Our data set gives evidence that Pakistani banks show similar response to cyclical movements. Therefore, we believed that the relationship between profitability and assets are stable across banks and that is why we decided to apply pooled OLS estimation method.

This paper does not include all dimensions of the profitability and internal factors but limited to the following variables:

- **Return on Asset (ROA):** The ROA is a functional indicator of bank's profitability. It is calculated by dividing net income to total assets. ROA shows the profit earned per dollar of assets which reflects bank's management ability to utilize the bank's financial and real investment resources to generate profits [(see, Ben Naceur (2003) and Alkassim (2005)].

- **Total Assets (TA):** The total assets determine the size of a bank. The size of the bank is included in this study, as an independent variable, which account for size related economies and diseconomies of scale. In most of the finance literature, the total assets of the banks are used as a proxy for bank size. However, since the dependent variable in the model (ROA) was deflated by total assets it would be appropriate to take natural logarithm before including it in the model to be consistent with other ratios.

- **Total Equity (TE) to Total Assets (TA):** The capital ratio (TE/TA), which is measured by total equity over total asset, reveals capital adequacy and should capture the general safety and soundness of the financial institution. It indicates the ability of a bank to absorb losses and handle risk exposure with shareholders. Pervious studies have found a positive relationship between TE/TA and profitability (Hassan and Bashir, 2004). TE/TA is included as an independent variable to examine banking profitability. TE/TA is expected to have a positive relation with performance because well capitalized banks are less risky and more profitable (Bourke, 1989).

- **Total Loans (TL) to Total Assets (TA):** Asset composition (TL/TA), which is explained by total loans divided by total asset, provides a measure of income source and measures the liquidity of bank assets tied to loans. TL/TA is included in the study of profitability as an independent variable to determine the impact of loans on banks' profitability.

- **Total Deposits (TD) to Total Assets (TA):** The ratio of deposits to total assets is another liquidity indicator but is considered as a liability. Deposits are the main source of bank funding and hence it has an impact on the profitability of the banks. Deposits to total assets ratio is included as an independent variable in this study.

4. Results and Estimation

The current section deals with the results of the study which include the descriptive statistics, econometric results of the model, and tests for robustness relevant for the study. The empirical evidence on the determinants of banks' profitability or Return on Assets (ROA) is based on balanced panel data, where all the variables are observed for each cross-section and each time period. The descriptive statistics and correlation matrix are calculated and presented in   Table 1and Table 2 respectively, for ready reference.

Table 1: Descriptive statistics

Statistics/Variables	ROA (%)	ASSETS ($)	TE/TA (%)	TD/TA (%)	TL/TA (%)
Mean	0.018	316510.0	0.068	0.798	0.565
Median	0.016	255600.5	0.063	0.807	0.573
Maximum	0.206	817758.0	0.227	0.895	0.709
Minimum	-0.054	66320.00	0.014	0.689	0.403
Standard Deviation	0.029	206315.0	0.040	0.047	0.055
Skewness	4.807	0.824615	1.392	-0.495	-0.630
Kurtosis	33.20	2.615575	6.349	2.928	4.115
Observations	50	50	50	50	50

Table 2: Correlation Matrix

	ROA	LOG(ASSETS)	TE/TA	TD/TA	TL/TA
ROA	1.000				
LOG(ASSETS)	-0.154	1.000			
TE/TA	0.694	0.233	1.000		
TD/TA	0.138	0.034	-0.398	1.000	
TL/TA	-0.034	-0.361	-0.210	-0.004	1.000

The model for the bank's profitability is selected on the basis of strong diagnostics and high value for the R-squared. The results are represented in Table 3.

Table 3: Pooled Least Square
Dependent Variable = ROA

Variable	Coefficient	Std. Error	t-Statistic	Probability value
Constant	0.050	0.084	0.595	0.554
LOG(ASSETS)	-0.015	0.004	-3.602	0.000
TE/TA	0.647	0.077	8.383	0.000
TD/TA	0.139	0.063	2.215	0.031
TL/TA	0.010	0.053	0.198	0.843
R-squared	0.63			
Adjusted R-squared	0.59			
F-statistic	19.11*			

* indicates 0.01 percent significance level.

The value for the R-squared in the model is 0.63 which endorses that 63% of the variation in the dependent variable is explained by the independent variables of the model. The 37% variation in the dependent variable remains unexplained by the independent variables of the study. The value for the F-statistic is 19.11 and is significant endorsing the validity and stability of the model relevant for the study.

The results of other diagnostics suggest that the Log (assets) have significant negative relation with ROA, where total assets indicate the size of the bank. This negative relationship shows that the size of the bank have significant negative effect on profitability. It suggests that larger banks achieve a lower ROA. Same results have been found by Bourke (1989). Capital ratio shows a significant impact on dependent variable ROA. TE/TA indicates positive and significant (at 1%) relationship with ROA, meaning that well-capitalized banks experience higher returns. These results are inconsistent with the study of Vong *et al* (2006), Burki and Niazi (2006) and Alkassim (2005). Total Deposits to total assets has the positive and significant impact on the profitability of the bank. It shows that deposits have positive impact on profitability and banks depending on deposits for funds can achieve better return on assets. This result is consistent with the results of previous research [(e.g., Alkassim, F. A. (2005)]. Another variable TL/TA show positive but insignificant relationship with ROA. This indicates that with more loans the chances of return on assets will be low but as the relationship is insignificant, the relation is not conclusive. This result is consistent with the study of Athanasoglou et al. (2006)

The test to detect multicollinearity (variance inflation factor) is also performed to support the validity of the regression results. In case of VIF, if the result is below the 10 and Tolerance near to zero suggest no multicollinearity (Gujrati, 2003). In Table 4 results of VIF and tolerance factor is reasonably good. The values of variance inflation factor for the variables in the model ranges from 1.177 to 1.309 for TL/TA to TE/TA suggesting the absence of multicollinearity among the variables of the model.

Table 4: Values of Tolerance and Variance Inflation Factor (VIF) for ROA

Variables	Tolerance	Variance Inflation Factor
LOG(ASSETS)	0.833	1.201
TE/TA	0.764	1.309
TD/TA	0.822	1.216
TL/TA	0.850	1.177

4.1. Robustness test: (Incremental regression)

The incremental regression is performed by removing individual independent variables from the model and by checking the effect on the value of R-squared. Among all the variables removed, capital has altered the value of R-squared to a highest degree (21% decreases in the portion of the dependent variable explained by independent variables) as the value for the R-squared changes from 63% to 42%. This substantial decrease in the value of the R-squared shows the importance of income inequality in the model. This importance is also highlighted in the regression result as the value of coefficient of the variable (0.647) is highest among all the variables. The result is presented in Table 5 and 6 below.

Table 5: Incremental Regression:
Dependent Variable: Return on Assets (ROA)

Variable	OLS 1	OLS 2	OLS 3	OLS 4	OLS 5
Constant	0.050 (0.55)	0.060 (0.36)	0.156** (0.03)	0.217*** (0.09)	-0.152** (0.03)
LOG(ASSETS)	-0.015* (0.00)	-0.015* (0.00)	-0.014* (0.00)	-0.008 (0.23)	---
TE/TA	0.647* (0.00)	0.645* (0.00)	0.575* (0.00)	---	0.590* (0.00)
TD/TA	0.139** (0.03)	0.139** (0.03)	---	-0.083 (0.36)	0.112 (0.11)
TL/TA	0.010 (0.84)	---	0.004 (0.94)	-0.055 (0.50)	0.071 (0.21)
R-squared	0.62	0.62	0.58	0.42	0.52
Adjusted R-squared	0.59	0.60	0.56	0.39	0.49
F-statistic	19.11 (0.00)	26.01 (0.00)	21.98 (0.00)	17.82 (0.00)	16.78 (0.00)

*Significant at 1%, **significant at 5%, ***significant at 10%

Table 6: Results of Incremental Regression removing Total equity as percentage of total asset

Models	SAARC
R-squared (Original)	0.63
R-squared (after the removal)	0.42

5. Conclusion

It is generally agreed that a strong and healthy banking system is a prerequisite for sustainable economic growth. Banks in Pakistan have been undergoing major challenges in the dynamic environment over the past few years. In order to resist negative shocks and maintain financial stability, it is important to identify the determinants that mostly influence the overall performance of banks in Pakistan.

In our study, individual bank characteristics (internal factors only) are considered as determinants of bank profitability in Pakistan. Banks with more equity capital, Total Assets, Loans, and Deposits are perceived to have more safety and such an advantage can be translated into higher profitability. Our findings in this regards are:
- Higher total assets may not necessarily lead to higher profits. The negative coefficient of size, significant at the 1 percent level, indicates that this relation might be negative due to diseconomies of

scale i.e. possible bureaucratic bottlenecks and managerial inefficiencies suffered by banks having too large size and network.

- Higher loans contribute towards profitability but their impact is not significant that reveals that more dependence on one major asset, may lead to profitability but with less significant impact on overall profitability.
- One major finding was the negative relationship of loans towards profitability when one of the banks showed a loss.
- Total deposit to total assets and total equity to total assets showed a positive and significant relationship with profitability indicator ROA
- Overall it is concluded that Total Assets, Equity/Total Assets, Deposits/Total Assets, and Loans/Total Assets are the major internal determinants of profitability of banks in Pakistan.

Further research can be extended to explore the above findings and to include some other internal factors such as doubtful loans, general bank charges, or reserves ratios, and external factor as well.

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Appendix

A. Name of Banks Used in the Study

1. Muslim Commercial Bank
2. United Bank Limited
3. National Bank of Pakistan
4. Habib Bank Limited
5. Bank Alflah
6. Allied Bank Limited
7. Bank of Punjab
8. Habib Metropolitan
9. Bank Al-Habib
10. Askari Bank