

Determinants of Bank Profitability in Pakistan: A Case Study of Pakistani Banking Sector

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Abstract: In Pakistan, the banking performance is influenced by deregulation, financial modernization and technological improvement. Financial sector is the back bone of the sustainable economic growth. So it is very important to assess the negative shocks in order to maintain the financial stability in Pakistan. This study is conducted to find out the main determinants of banks profitability considering the bank specific variables. The analysis has been conducted on 16 banks on the basis of availability of data over the period 2000 to 2010. This paper uses fixed effect model and random effect model to examine the impacts of net interest margin, profit to asset ratio, bank size, loan growth, non-interest earning, overhead expenses, taxation, insider lending, operating expenses, non-performing loans, return on asset ratio and deposit to asset ratio. The empirical results show a strong association between some banks specific variables and their profitability. The variables of deposit to asset ratio, deposit to loans ratio, loans to asset ratio, loan growth, non-performing loans, net interest margin, tax, non-interest income and return on asset are the main determinates of banks profitability in our analysis. Furthermore, the banks are divided into two groups according to their market capitalization i.e. large and small banks.. LNG is significant at 1% with positive value (3.56734) indicating that with loan growth, the bank's capacity to earn more in the market enhances. In case of small banks, the variable of loan growth is insignificant. Hence, the non-performing loans are seriously reducing the profitability of banks in small banks.

Key words: Financial Institutions • Banks • banks specific variables • Correlation • Fixed and random effect model • Pakistan

INTRODUCTION

Recently, service sectors have shown considerable presence in business world [1]. The banking sector has been experiencing dramatic changes over the last decade. The banking performance is influenced by deregulation, financial modernization and technological improvement. These factors burst in the shape of management costs and revenues. The management is more concerned to generate an acceptable return keeping in view the intensity of risk exposure. Online banking along with the conventional banking is also contributing significantly to the growth of banking sector [2]. The functioning of Islamic banking is similar to conventional banking but the difference

lies in rules and regulations [3]. Many researches have been conducted to measure the banks efficiency issue [4]. Many researches have been conducted to investigate the relationship between risk and output quality factors and bank efficiency [5, 6]. The banking sector is considered as the back bone of an economy as it strengthens the economic activities and the growth. This is really a fact in case of Pakistani banking sector. Being the major supplier of funds, the bank's stability is the major cause of concerned in the country. The economic performance in the country is not encouraging which is adversely influencing the banking performance. The determinants of banking profitability are essential and crucial to the stability of economy and the banking sector.

Due to privatization of public sector banks and merger/consolidation, the ownership structure has changed along with structure. These changes are receiving great attention on the national and international level. The mobility of capital enforced the economic structure to strengthen the internal system to face the capital flow volatility. A sound financial system plays a key part in improving infrastructure and economic stability. The determinants of profitability in banking system have been observed and explored but consensus has not been found. A few studies are conducted in order to determine the factors influencing the banks profitability. Some researcher considered only banking characteristics, whereas other included the macroeconomic factors in order to find out the determinants of banks profitability.

A very few studies have been conducted in order to resolve the issues of determinants bank's profitability in Pakistan. This study is conducted to examine the main determinants of banks profitability in Pakistan which may contribute in resolving the issue of these determinants.

Literature Review: Literature provides so many evidences which identify the major determinants of banks profitability. Some studies are conducted on a particular country and others on panel of countries. In this study, we have only focused on the bank specific variables as the major determinants of banks profitability in Pakistan. These factors are bank related and reflect the performance of management. These forces are highly attached with the management decisions and reflect the quality of management in brief. Though an eminence management leads to a superior bank performance, it is tricky, if not impossible, to evaluate management worth directly.

The balance sheet is a vital component of financial statements that explains the financial situation of a bank at a particular point in time. It provides information about the allocation of resources with respect to management policies. The items in the balance sheet are the indicators of potential and capability of a bank with respect to earning and stability in the market.

A variety of variables can be obtained from the balance sheet which influences the performance of a bank. The variables that received more attention in the literature are the deposits, assets, liabilities, capital ratio, credit risk, productivity growth and size of the bank.

The capital adequacy ratio impacts positively on banks' profitability [7]. Demirguc-Kunt and Huizinga [8] found a positive relationship between capital ratio and banks' profitability. They conducted a comprehensive

study for both developed and developing countries. The larger banks are efficient in managing their costs in order to increase their profitability. Such a negative relation between expenses and profitability has been supported by Bourke [7] and Jiang *et al.* [9]. The dependent variable is ROA which is derived by dividing net income on its total assets. The ROA reflects how efficient a bank's management is in using the bank's real investment resources to produce profits.

The banks with healthy capitalization have very little bankruptcy costs and have relatively high interest margin [10]. Similarly, Naceur [11] also conducted a study in order to find out the relationship between interest margin and profitability. This positive relationship between profitability and expenses has been observed in Tunisia by Naceur [11] and in Malaysia by Guru *et al.* [12]. They concluded that the interest margin and profitability are highly associated with capital ratio and large overheads. There is a negative relationship between high loan ratio and banks' profitability as is documented by Hassan and Bashir [13] and Staikouras and Wood [14]. In another study, Goddard *et al.* [15] found that bank's growth increases the bank's capacity to generate more revenue in European countries. Alkassim [16] conducted a study on Islamic banks by considering both internal and external factors for GCC countries for a period from 1996-2005. He suggested that asset quality of conventional banks is comparatively better as compared to Islamic banks. He also stated that interest free lending is positively associated with Islamic banks' profitability and the expenses impacts negatively on the profitability of commercial banks. Athanasoglou *et al.* [17] conducted a study on determinants of bank profit for the South Eastern European countries. They focused on the credit institutions for the period between 1988 and 2003. They concluded that microeconomic variables affected the banks' profitability. Some other studies reported positive relationship between the tax variable and profitability [8, 9, 18]. Amor, Tascón & Fanjul [19] conducted a study for the Organization for Economic Co-operation and Development countries. They concluded that high leverage ratio contributes in the banks profitability positively. The overheads expenses also contribute negatively in the profitability of the banks. Athanasoglou *et al.* [20] conducted a study in order to analyze the relationship between of bank specific, Industry-specific and macroeconomic and the profitability of Greek banks. They found a positive significant relationship between equity to asset ratio and banks profitability.

In another study, Idris *et al.* [21] focused on determinants of Islamic banking profitability in Malaysia. They concluded that the bank size has the strong positive association with Islamic bank profitability. Vong and Chan [22] examined the relationship between internal and external factors of banks and their profitability on the Macao Banking industry for 15-years. They concluded that the greater capitalization creates low risk and contributes in the bank profitability. They also concluded that the size of banks impacts the profitability positively. Al-Hashimi [23] conducted a study considering net interest margin as a determinants of banks profitability on 10 SSA banks. He proposed that credit risk and operating deficiencies make clear the majority of the disparity in net interest margins across the region. Macroeconomic risk has only partial effects on net interest margins. When banks move from interest income services to non-interest income services, profitability may decline. The relationship between non-interest income ratio and bank profitability is expected to be negative.

In the recent IMF working papers, Flamini *et al.* [24] focused on determinants of commercial banks profitability in Sub-Saharan Africa. Using 379 banks as a sample from 41 countries, they concluded that beside the credit risk, banks ROA are also linked with larger bank size. They further concluded that the bank's returns are also related with the macroeconomic determinants. Masood *et al.* [25] found a causal relationship between return on asset and return on equity on Saudi banks.

On the basis of above literature, a model has been established considering the banks specific factors as the determinants of banks' profitability. The model is developed on the basis of strong association of literature.

Similarly, some studies are also conducted to evaluate the difference between large and small banks. For example, Kosmidou *et al.* [26] evaluate the performance of UK banks over the period 1998-2002 and discover that the smaller banks performed better than larger banks. Moreover, they suggested that small UK-owned banks are more profitable with high regulatory capital ratios [27]. So on the basis of the model; comparison between small and large banks is done in order to evaluate their performance.

Explanation of Variables:

Net Interest Margin: It is calculated by subtracting interest expenses from interest income over total assets

Net Profit/TA: Before tax profit/ total assets

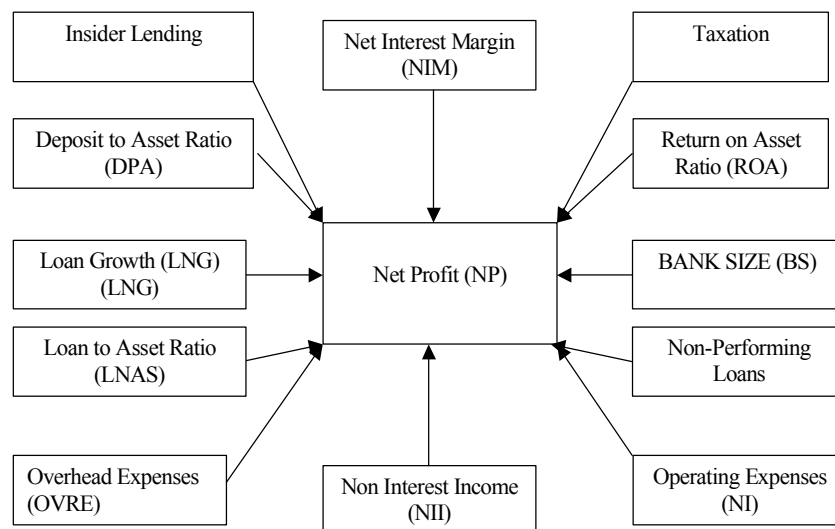
Bank Size: Book value of equities (assets minus liabilities)/ total assets

Loan Growth: Total loans-previous loan / previous loans

Non-Interest Earning Assets/TA: Cash, non-interest earning deposit at other banks and other non-interest assets

Overhead/TA: personnel expenses and some other non-interest expenses over total assets

Taxation: The tax variable (TAX) is defined as taxes over operating profits before tax. This shows the aptitude of banks to apportion its portfolio to reduce its taxes. Positive relationship between the tax variable and



Model: Bank specific variables.

the profitability implies that the bank is capable to transfer the tax cost to its customers by raising the fees and the interest spread.

Insider Lending: Loans issued to the employee, directors and shareholders.

Operating Expenses: Operating expenses / total expenses

Non-Performing Loans: The loans declared as non-performing loans /total loans

Return on Asset Ratio (ROA): Total return for the year/total asset

Deposit to Asset Ratio: Loan to Asset Ratio 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.

DATA: The bank-specific variables are taken from the financial statement of each bank in Pakistan. The sample of 16 banks has been considered on the basis of availability of data. The data set covers a period of 10 years from 2000 to 2009. The information on the data is consolidated on 31 December of each year. The data for this period is selected due to the following main reasons.

- The data is available for this period.
- The international banking crises also emerged during this specific time period.
- Pakistan stock market fluctuated during the period which may impact the banks profitability.
- Pakistan faced the problem of terrorism during this specific time period which may influence the bank profitability.
- During the period, new banks are also established which created a competitive environment.

MATETRIALS AND METHODS

Model Specification: The different empirical models have been used to identify the determinants of banks' profitability. Kamaly [28] pointed out that there is no final methodology for any type of analysis. Each methodology depends upon the selected data, time period and number of variables. Different methodologies have been used by different authors as per their requirements. Each methodology is used with respect to data, time span,

number of variables etc. The basic functional form of the equation is as under:

$$NP = F(DPA, EQA, LNAS, LNG, NPL, ROA, INSL, TAX, OPRE, NII, NIM)$$

Where DPA is deposit to asset ratio for each bank, EQA represents the equity to asset ratio, LNAS represents the loans to asset ratio, LNG represents the loan growth, NPL represents non-performing loans of each banks, ROA represents return on asset, INSL represents the insider lending, TAX represents the tax paid on net income, OPRE represents the operating expenses, NII represents the non-interest income and NIM measures the net interest margin for each bank.

Panel Unit Root: Initially the unit root test was considered by Diebold & Nerlove, [29]. In time series data, Augmented Dickey-Fuller (ADF) test received incredible consideration with non-stationary null hypothesis. The panel unit root tests make the unit root test more effective and useful. Abuaf & Jorion [30] developed panel unit root test for multivariate model on the basis of autoregressive processes. To cover cross section correlation aspects, a new sets of panel unit root tests were developed [31, 32] which were independent and identically distributed (i.i.d.) for data assumption. These were considered for each cross sectional unit (39, 40 and 18). Asymptotic normality was formulated for large cross section unit (N) and time series data (T) by Breitung and Mayer [3]. Through this methodology, the serial correlation pattern could be incorporated for each cross section unit and time specific random effect for larger cross sectional unit (N). There was an objection on asymptotic dimensional assumptions that N & T have larger magnitude or equal value. Quah's [34] unit root methodology was extended by Levin, Lin and Chu [35]. They developed panel unit Root test by extending Quah's [34] unit root methodology. They included heterogeneity of each cross sectional unit (N) deterministic effect and error term serial correlation structure with homogenous autoregressive assumption. Briefly, there were shortcoming in LLC panel unit Root that include independent assumption of each cross sectional unit which makes LLC panel unit Root Tests ineffective if cross correlation exists between cross sectional unit. The other limitation which exposes this test is that the auto regressive parameters that are assumed are same for cross sectional unit.

Hadri Test for panel unit Root: Hadri [36] mentioned unit root test on the basis of residual that each cross section and time series have at level or stationary at first difference. Lagrange Multiplier Statistics (LMS) was considered by him. He calculated LM statistics on the basis of following formula:

$$LM = \frac{\frac{1}{N} \sum_{i=1}^N \frac{1}{T^2} \sum_{t=1}^T S_{it}}{\delta_{\varepsilon}^2},$$

Where in above Equation S_{it} capture the residual sum of each panel series, while S_{it} characterize variance in panel data. The Null hypotheses is rejected or accepted on the basis of Standardized Z-Statistics. The value of Z-statistics is given by:

$$Z_u = \frac{\sqrt{N}(LM_u - \varepsilon_u)}{\varsigma}, \text{ where } N = 0, 1$$

From above mention equation Z –statistics take in consideration both mean and variance of Panel data.

Where, D_{ki} is a dummy variable that capture value 1 for k bank and zero observations for banks. In the equation, X covers the set of explanatory variables t, D_{ki} covers individual specific effect for all banks. So we can specify our equation for fixed effect model as under:

$$NP_{it} = \sum_{k=1}^{16} \alpha_{1k} d_{ki} + \beta_1 DPA_{it} + \beta_2 BS_{it} + \beta_3 LNAS_{it} + \beta_4 LNG_{it} + \beta_5 NPL_{it} + \beta_6 ROA_{it} + \beta_7 TAX_{it} + \beta_8 INSL_{it} + \beta_9 NIM_{it} + \beta_{10} OPRE_{it} + \beta_{11} NII_{it} + \beta_{12} OVRH_{it} \varepsilon_{it} \quad (2)$$

In case of Random Effect Model, α_{1i} is assumed to be random not fixed.

We have also assumed that its mean is equal to $\bar{\alpha}_1$ and its variance is δ_{μ}^2 . we can easily obtain least square estimators in random effect or error component model. The equation for random effect model is as under:

$$y_{it} = \bar{\alpha}_1 + \sum_{j=2}^4 \beta_j x_{jit} + \mu_i + \varepsilon_{it} \quad (3)$$

Where $\alpha_{1i} = \bar{\alpha}_1 + \mu_i$

Resultantly, the simplified equation for random effect model is as under:

$$NP_{it} = \sum_{k=1}^{16} \alpha_{1k} d_{ki} + \beta_1 DPA_{it} + \beta_2 BS_{it} + \beta_3 LNAS_{it} + \beta_4 LNG_{it} + \beta_5 NPL_{it} + \beta_6 ROA_{it} + \beta_7 TAX_{it} + \beta_8 INSL_{it} + \beta_9 NIM_{it} + \beta_{10} OPRE_{it} + \beta_{11} NII_{it} + \beta_{12} OVRH_{it} \varepsilon_{it} \quad (4)$$

Where NP represents the total net profit for bank i in year t. The other variables are the same as presented in fixed effect model. In the model, β_{0i} is fixed.

Fixed Effect Model and Random Effect Model:

A panel data methodology is an appropriate methodology used for time specific and cross section specific analysis [16]. It covers the time and space dimensions by surveying cross section units over time. In the analysis, a balanced panel data has been used because each cross section units contained equal number of observations. This is the most appropriate methodology which reduces econometrics problems and where omitted or miss-measured variables have strong correlation with explanatory variables [38].

A country specific effect can be captured by fixed effect Model that includes N-1 countries specific dummies. It is assumed that α_{1i} remained fixed.

A general equation for Fixed Effect Model can be written as:

$$y_{it} = \sum_{k=1}^N \alpha_{1k} D_{ki} + \sum_{j=2}^4 \beta_j x_{jit} + \varepsilon_{it} \quad (1)$$

DISCUSSION

Panel Unit Test Results: We have applied Hadri test in order to check whether the data is stationary or non-stationary. According to the results of Hadri test, the data is stationary at level indicating that it accepts the null hypothesis of no unit root at level. The results of Panel Unit Root are shown below in Table 1. We have also checked the data at 1st difference and the results are shown below in the table along with level. From these results, it is clear that all variables are stationary at level. Therefore, the impacts can be analyzed through random effect and fixed effect models. We can use the random effect model or fixed effect model can be used in order to find out the determinants of banks profitability loans in Pakistan.

Result of Fixed Effect and Random Effect Model

Panel Estimation Results of All Banks: At the first instance, it is important to identify the order of integration for each variable. According to the results of panel unit root, the selected variables are stationary at level. This allows us to capture the results of selected variables on bank profitability through fixed effect or random effect model. All the bank specific variables have been included in the model. In random effect model, we can use less number of variables than number of observation for each variable. We have also included constant on the basis of its significance in our model. The results are shown in Table 2.

Hausmann Test: We use Hausmann Test criteria for selection of suitable panel model for the explanation purpose. This test is based on the significance or insignificance of Chi-Sq. Statistic. In order to select an appropriate model for explanation, we use the Hausmann test criteria. The Hausmann test results are given in Table 3.

Hausmann Test Results Criteria for Model Selection:

The Chi-Sq. Statistic value is 0.000000 and the probability value is 1.0000 (see table 3). The chi-sq statistic value is insignificant at 10% level and the probability is 1 which describes that the results of fixed effect are not appropriate for explanation as per the results of Hausmann test. The results of the random effect model are appropriate for the study, so these are explained below:

Table 1: Panel Unit Test Results:

Variable name	Hadri statistics (z-stat) at Level	Hadri statistics (z-stat) at first difference
DPA	4.85918 (0.0000)**	12.6119 (0.8064)**
DPL	5.42820 (0.0000)**	5.32685 (0.0000)**
BS	4.71186 (0.0000)**	7.5392 (0.0000)**
INSL	4.66123 (0.0000)*	12.3498 (0.0909)***
LNAS	7.37021 (0.0000)**	11.4388 (0.0000)**
LNG	6.71537 (0.0000)*	13.5454 (0.0000)*
NP	6.73106 (0.0000)*	9.9241 (0.0000)*
NPL	3.89717 (0.0000)*	15.9065 (0.0000)**
NIM	5.30720 (0.0000)*	17.1017 (0.0000)**
TAX	8.04734 (0.0000)*	8.81494 (0.0000)*
ROA	6.64289 (0.0000)*	21.4757 (0.0000)*
OVE	10.2504 (0.0000)*	16.9242 (0.0000)*
NII	7.2504 (0.0000)*	14.3568 (0.0000)*
OPRE	6.5508 (0.0000)*	16.9242 (0.0000)*

Table 2: Results of Fixed and Random Effect Model for All Banks

Name of variables	Fixed effect model	Random effect model
DPA(-1)	9.10401 (0.0036)*	9.40896 (0.0094)*
DPL	7.525346 (0.0110)**	7.107747 (0.0013)*
BS	8.00440 (0.2091)	9.08279 (0.2513)
INSL	-0.907294 (0.3728)	-0.624820 (0.5906)
LNAS	-0.106428 (0.8562)	-0.326835 (0.0737)***
LNG(-1)	4.407942 (0.1237)	6.234033 (0.06489)***
NPL	-0.367938 (0.0700)***	-0.252288 (0.0840)***
NIM	4.407942 (0.12567)	6.234033 (0.07467)***
TAX	-6.407942 (0.1237)	-6.234033 (0.03489)**
ROA	16.99289 (0.1108)	17.10373 (0.0726)***
OVE	-3.073777 (0.4618)	-2.336237 (0.3442)
NII	0.191974 (0.7343)	0.525230 (0.04044)**
C	1675.514 (0.0005)	1444.717 (0.0016)
R-squared	0.533273	0.587460
Adjusted R-squared	0.126682	0.23130
F-statistic	1.613200	1.104678
Prob(F-statistic)	0.067754	0.368541
Durbin-Watson stat	1.621767	1.517512

Note: *, **, *** indicate the significance at 1%, 5% and 10% level. Probability is given in parentheses

Table 3: Correlated Random Effects - Hausman Test Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	11	1.0000

Table 4: Comparison of large and small banks (random effect model)

Variable name	Large banks	Small banks
BS	7.31553 (0.0004)*	6.115307 (0.0903)***
INSL	-0.64562 (0.4561)	-0.84537 (0.4391)
NII	2.894300 (0.2019)	4.177653 (0.2739)
LNG(-1)	3.56734 (0.0019)*	-0.15675 (0.2739)
NPL	-2.65792 (0.1801)	-8.76854 (0.0039)*
NIM	3.61234 (0.0239)**	4.177653 (0.0739)***
TAX	12.89430 (0.0301)**	14.19087 (0.0239)**
R-squared	0.370930	0.388195
Adjusted R-squared	0.123214	0.236132
F-statistic	2.489610	4.276735
Prob(F-statistic)	0.043947	0.002689
Durbin-Watson stat	1.686784	2.319368

Note: *, **, *** indicate the significance at 1%, 5% and 10% level. Probability is given in parentheses

Explanation of Random Effect Model: The variables of long growth and loan to asset ratio have been taken with one year lag because these both variables are expected to impact the profitability in the next year. The variables of deposits to asset ratio (DPA) and deposit to loan ratio (DPL) are significant at 1% indicating serious impacts on bank profitability. Both the variables contribute positively to net income of bank in Pakistan which is consistent to the earlier studies. The variables of tax (TAX) and overhead expenses (OVE) are significant at 5% with negative values which means that these two variables reduce the bank profitability. Guru *et al.* [12], Kosmidou [39] and Pasiouras *et al.* [40] also find out the inverse relationship between bank profitability and these variables for Malaysia, Greece and Australia respectively. The loan to asset ratio (LNAS), loan growth (LNG), net interest margin (NIM) and return on asset (ROA) are significant positive at 10% indicating that the growth in such variables increases the bank profitability. Return on asset has positive impacts on banks profit which is similar to earlier studies by Kosmidou [39], Pasiouras *et al.* [40], Demircuc-Kunt and Huizinga, [8] and Berger, [41]. Kosmidou [39] and Pasiouras *et al.* [40] also confirm this negative effect on net interest margin. The variable of non-performing loans (NPL) is also significant at 10% with

negative value indicating that it reduces the bank profitability [6, 42, 43]. All these variables are the major cause of concern for banks because they considerably impact the bank profitability.

Equity to asset ratio (EQA), insider lending (INSL) and non-interest income (NII) show no significant impacts on bank profitability. These variables are not major cause of concern as per the results of this study.

Comparison of Large Banks and Small Banks:

The banks are grouped into two categories' as per their capitalization in the market. Only seven variables are selected for this panel estimation because random effect model allow this limited number. The most priorities variables are selected for this estimation. The results are shown in Table 4.

The variables show different impacts in case of small and large banks. The bank size (BS) is significant in both the cases. It is significant at 1% with positive value (7.31553) in case of large bank indicating that the bank size contributes more in bank profitability. The large banks are efficient in increasing their profitability. In case of small banks, the bank size (BS) is significant at 10% with positive value (6.115307). The insider lending's (INSL) and net interest margin (NII) show insignificant impacts in our estimation in case of large and small banks respectively. The variable of loan growth (LNG) shows significant positive impacts in both cases. LNG is significant at 1% with positive value (3.56734) indicating that with loan growth, the bank's capacity to earn more in the market enhances. In case of small banks, the variable of loan growth is insignificant indicating that it is not contributing in the net income of these banks. The results show that non-performing loans also contributes negatively in case of small banks. The non-performing loans are seriously reducing the profitability of banks in small banks. The net interest margin (NIM) is significant in both the cases with positive values indicating that the net interest margin contributes in the bank profitability [10]. The tax variable is also significant with positive values. Our results show that large banks are efficient in managing their performance as compared to small banks. These results are in contrast with the previous results found by the earlier researchers. For example Kosmidou *et al.* [26] evaluated the performance of UK banks over the period 1998-2002 and discovered that smaller banks performed better than larger banks. Moreover, they suggested that small UK-owned banks are more profitable with high regulatory capital ratios [27].

CONCLUSION

This study endeavors to highlight the bank specific determinants of bank profitability and study emphasis on the determinants of banks' profitability for the period 2000 to 2009 and efficient image of the profitability on banking sector of Pakistan for the period 2006-2009. The variables of deposit to asset ratio, deposits to loan ratio, loan to asset ratio, loan growth, non-performing loans, net interest margin, tax, return on asset and net interest margin are significantly impacting the banks' profitability. Some of the variables do not impact the banks profitability during the selected period and selected sample of banks. Moreover, the banks are divided into two groups according to their capitalization i.e. large and small banks. The results are similar in both the cases except the non-performing loans. The large banks are efficient in managing their non-performing loans as compared to their counterpart. This study also helps the academicians, scholars and bankers to visualize the main determinants of banks' profitability.

Future Implications: The results of this study recommend creative area of supporting research that comprises:

- A comparative study can be conducted between financial and non-financial sectors.
- The macroeconomic variables can be included for further enhancement of research.
- The corporate governance can be considered as a major determinant of banks' profitability.

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