Full Length Article

Determinants of Profitability of Banking Industry in Pakistan

Misbah Nadeem[1], Hassan Raza[2], Fauzia Mubarik[3]

[1]MS Scholar, National University of Modern Languages, Islamabad, Pakistan
[2]Lecturer, National University of Modern Languages, Islamabad, Pakistan
[3]Assistant Professor, National University of Modern Languages, Islamabad Pakistan

A B S T R A C T

Purpose: The relationship between bank profitability and bank-specific and macroeconomic factors has important implications for a host of public policy questions. In the current study, balanced panel data on all scheduled banks over a period of 2006 to 2017 has been used to provide novel estimates of bank profit and its influential factors.

Research Methodology: Further this study modeled the structure-conduct-performance hypothesis (SCP); it reflects the setting of prices that are less favorable to consumers (lower deposit rates, higher loan rates) in more concentrated markets as a result of competitive imperfections in these markets and lead supernormal profits The results of the current study have been obtained by using regression analysis and unit root analysis which deals with stationary and non-stationary of time series data. .

Results: The results of the current study are significant and supported by the previous literature. In bank-specific characteristics, lagged bank profitability, capital ratio, and size found to have a positive relationship with bank profits while Loans have a negative and significant relationship with bank profits deposits have a positive and insignificant relationship with banks profitability. In macroeconomic factors such as inflation, corporate tax rate, negative and insignificant relation has been found.

Originality/Value: This study implies that the profitability of banks can be enhanced by increasing the capitalization of banks. Endeavors should be made by banks in order to increase and maintain the retained earnings and reserves

Keywords: Profitability, Return on Assets, Macroeconomic, Bank-specific, Corporate tax

1. INTRODUCTION

The economic development of any nation is affected by its monetary conditions. In other words, for the growth of an economy of the country, a major role is played by its financial sector. As the banks are business enterprises their target is to generate profits. Therefore, the success of the management of banks' is indicated by their performance to generate profitability. Thus, for an investor, profitability is one of the important indicators. According to the Economic survey of Pakistan for period 2014-2015, it was

observed that Europe and other countries including Pakistan were affected by unstable macroeconomic conditions as the global financial system has gone through crises of debt. It is important to find determinants of growth of the banking industry. A complete, more growing and strong banking industry is essential for the financial system. This shows the significance of research in the domain of profitability of the banking industry, thus, after the recent financial crises; it attracted the attention of scholars.

Two important theories (RMP) relative market postulate and (SCP) structure conduct performance postulate are anticipated to get the support of the theoretical framework. Theories are concerned with dynamic analysis profitability of the banking industry including the internal and external factors which affect the profitability. Relative market power (RMP) hypothesis suggested that those firms which use product differentiation strategy are able to gain large market share and they can become the leader in the market, therefore these firms can earn supernormal profits by setting high prices.

The present study examined the determinants of profitability of the banking industry by including bank-specific determinants and macroeconomic determinants which are return on asset, capital adequacy, loans, deposits, consumer price index and corporate tax. The data set for period 2006-2017 for listed banks have been collected in this study.

1.1. Background of the Study

The study by (Haslem 1968) statistically analyzed the comparative profitability of all scheduled banks. Macroeconomic factors and industry factors have been used to analyze the profitability of the banking industry. Therefore, the research in the banking industry had captured slightly attention and little importance by the simplistic nature of banking business. The names of various documented financial institutions were removed as the two years of depression from 2007 to 2009 knockouts the ground from its large influence. Yet, the importance of the banking industry for strong financial system was continuously considered by Ash Demirguc-Kunt. As highlighted by (Demirgüç-Kunt and Huizinga 1999), the profitability of the banking industry was getting importance, after the two years financial crisis that is from 2007 to 2009.

1.2. Problem Statement of the Study

Current research study focuses on the important determinants which play a vital role in the profitability of the banking industry. To study the important factors of profitability of the banking industry is not simply important for management but it is crucial for decision makers so that they can adjust banks performance to enhance their productivity.

1.3. Research Objectives

- To find out the relationship between loan and profit
- To investigate the effect of deposits on return on profit
- To determine the correlation between capital adequacy and profit
- To investigate the impact of bank's size on return on profit
- To understand the link between inflation and profit
- To examine the effect of the tax on profit

1.4. The significance of the Study

In ideal model settings, all three groups of given variables which are bank-specific, industry-specific and macroeconomic factors are intended to impact positively and negatively collectively on banking profitability, so it is important to use all those at a single time (Athanasoglou, Brissimis et al. 2008). To make the analysis in that setting, this study uses two groups of internal and external variables which are bank-specific and macroeconomic determinants, identified by the previous literature which makes this study significant and reliable. The current study has used the updated data for the period of 12 years which helped to produce results to gauge for the economic phenomenon of determinants of banking profitability and will be able to provide explanations across a longer time span; another significance of the study. Most of the studies have not used this much amount of data set. Furthermore, predictions and projections based on the long time span of historical data, and the policy recommendations will be easier to be generalized thus reliability and validity of the study has enhanced.

1.5. Contribution of the Study

The present research has contributed to different aspects to the literature of

determinants of profitability of the banking industry. The current study is concerned with the inside and outside determinants affecting the profitability of the banking industry which are bank-specific factors and macroeconomic variables which will prove to be helpful in future academic research. The results of the research can be used by decision makers, that is, while making decisions, the determinants which have a great impact on profits of banks will be considered first so which leads to enhancing the profitability this would play an important role in economic development of the country.

2. LITERATURE REVIEW

An economic indicator of a country's development is its financial sector; hence the banking industry contributes towards the progress of the nation. Over the phase of 62 years, important changes have been observed in Pakistan's' banking sector. Initially, the country suffered from a deficiency of investment and uncertainty. Collectively, as a result of control and function performed by State Bank of Pakistan (SBP) ensuring improvements were made in order to encourage the reserved sectors to set up financial organizations and banks. Moreover, the developments in the privatization of banking sectors which was initiated in 1992 motivated and forced foreign banks and local investors respectively. (Ahmad, Malik et al. 2010).

2.1. Theoretical Review

Numerous research studies in literature related to banking and other general organization and industrial studies discover the positive statistical association between the measure of the structure of market and productivity whether it is market share or it is concentration. It is proposed that the Potential profits, which are gained by larger market power and produced by enhancing the merged firms' market share and concentration, has encouraged the current wave of merger movement in the banking sector. According to The traditional postulate, structure conduct performance hypothesis (SCP), this outcome exhibits the price settings which are not more favorable to the customer that is (low deposit rates and high loan rates) in more intense markets because there are competitive limitations in these markets. The study by (Shepherd 1988), suggests that only those firms which have greater market shares and offer differentiated products are the leaders

which exercise market power in setting prices of these differentiated products and earn large profits.

According to (Demsetz 1973) the positive relationship profit-structure is forged, somewhat from the direct origin, with productivity driving market structure along with profits. As measured by the version of scale-efficiency, under the efficient structure hypothesis, all firms have equally good technology and management but several firms lie at more productive scales as compared to others, hence there unit costs are lower and their unit profits are higher. These firms are successful in achieving the greater market shares which result in high level of density, again resulting positive relationship of profit structure as a spurious outcome. (Lambson 1987)

2.2. Empirical Review

(Kohlscheen, Murcia Pabón et al. 2018) observed the determinants of the banking industry by analyzing 534 banks from emerging economies and find that high-interest rate leads to high profitability as compared to lower interest rates. (Anbar and Alper 2011) studied the impact of internal and external factors on banks profitability by collecting the data from Bank Scope database. The authors used fixed-effect panel regression on collected data and concluded that banks profitability was positively affected by inflation bank concentration and economic growth while capital adequacy and bank size negatively affected the banks' earnings. (Onofrei, Bostan et al. 2018) investigated the degree of impact of macro and microenvironment determinants on the central and Eastern European countries. The authors analyzed ten years banks data and suggest that cost to income, credit, and GDP have a great impact on banking profitability.

(Zampara et al 2017) attempt to study the external determinants which have an impact on the bank's profitability in Greece over the time period of 2001 to 2014.the authors consider industrial and macroeconomic factors as external determinants for the study. By applying regression analysis on the collected data the authors concluded that both industrial and macroeconomic determinants have a significant effect on the bank's profitability. Moreover, the author covered the time period of financial crises which indicated that banks; profitability is highly affected by the economic condition of the country.

(Menucucci & Paolucci 2016) attempt to examine the relationship between banks profitability and banks internal factors in the European banking industry. Authors used unbalanced panel data and applied regression analysis. The authors constructed the results that bank profitability in Europe is positively affected by bank size and capital while it is negatively impacted by loan loss provision. Similarly   (Nicolae et al 2015) observe the internal and external determinants of banks' profitability in the European Union. The authors find empirical results indicating that liquidity risk, credit, and management efficiency have a significant influence on banks 'profitability which was indicated by a proxy of Return on Assets.(Messai, Gallali et al. 2015) studied the determinants of profitability in western European countries (Ireland, Spain, Italy, Portugal, and Greece) by observing 322 banks during the financial crises. By using the GMM approach, the authors find that the bank's profitability of Western European's countries significantly affected by the situation of the country.

(Simiyu and Ngile 2015) observed the impact of external factors on the financial profitability of banks listed in Kenya in (NSE) Nairobi Securities Exchange. Results showed a significant impact of macroeconomic factors on banks profitability. (Alshatti 2015) reviewed the impact of liquidity controlling on profitability in the banking industry of Jordan by taking thirteen commercial banks of Jordan over the period 2005-2012. By using a stationary test model proposed by Augmented Dickey Fuller (ADF) for analysis of data it was concluded that the liquidity management have a significant effect on the commercial banks' profitability in Jordan. Research study conducted by (Noman, Chowdhury et al. 2015) observed the different determinants of profitability of the banking industry of Bangladesh. The reported results revealed the significant effect of determinants on the profitability measures. (Alemu and Negasa).   Examined the determinants of banking profitability classified as bank-specific variables, industry related factors and macroeconomic variables on the banks of Ethiopia over a period of 2002-2013. Regression results showed that bank-specific variables and macroeconomic variables have a negative effect on profitability while industry related variables affected positively and significantly on profitability measure.

(Jaber and Al-khawaldeh 2014) observed the internal and external factors of

banking profitability in Jordan over period 2007-2012, by analyzing the statistics of 11 local commercial banks. The model of the research has been estimated by using regression analysis. Results demonstrated that all internal factors have a significant impact on banks performance measure where the impact of capital ratio and liquidity ratio was insignificant. With respect to external factors, consumer price index, capitalization of the stock market over assets of banks and assets allocated by banks money from deposits were significantly associated with banks performance measure. (Osamwonyi and Michael 2014) reviewed impact of external factors on the bank's performance in Nigeria. The study used pooled ordinary least squares technique, the concluded results revealed the positive relationship of external factors with profitability measure.

(Touny 2014) accompanied to determine the impact of the growth of the economy, economic globalization, trade openness and financial liberalization on the profitability of the banking industry in Egypt and Saudi Arabia. The data was analyzed by regression technique. It was identified that there was a long-run negative impact of economic growth, while the effect of real interest rate and financial liberalization have a positive impact on credit to the private sector. The research by (Alexiou and Sofoklis 2009) investigated inside and outside determinants that have an impact on the profitability of the banking industry in Greek. The study considered the time period ranging from 2000 to 2007. The conclusions of the results explained that the main determinants of the profitability of banks were a credit risk, the productivity of bank, bank efficiency, liquidity and size of the bank. While there was a weak and unclear relationship between macroeconomic factors and profitability of banks. The macroeconomic variables used were gross domestic product growth rate, consumer price index and private consumption. Another study conducted by (Acaravci and Çalim 2012) contributed in the literature by identifying the internal and external variables affecting the profitability of banks in the commercial banks of Turkey for a time period of 1998-2011. Johansen-juseliu cointegration analysis technique was used for the analysis of data. Their research also suggested that the effect of internal factors was more significant relative to the effect of external factors.

The study by (San and Heng 2013) investigated the effect of bank-specific and macroeconomic factors on the profitability of the commercial banks of Malaysia Regression analysis was used for the data analysis which revealed that there was a negative relationship between bank profitability and macroeconomic factors. Whereas there was a positive relationship between the profitability and bank-specific factors. (Olalekan and Adeyinka 2013) examined the influence of capitalization on profitability in local and foreign banks of Nigeria. Records were collected by using questionnaires as well as from the financial statement of banks over the period of 2006-2010. The results of primary data analysis suggested that there was an insignificant effect of capital on banks profitability while the significant relationship between capital and profitability was revealed from the results of secondary data analysis. It remained discovered that adequate capital provides a cushion against losses which could not be covered by regular earnings.

(Muda, Shaharuddin et al. 2013) analyzed the factors that have an impact on Islamic banks profitability in banks of Malaysia, and also the impact of the global financial crisis on profitability. From the results, it was identified that bank-specific factors were found to be significantly positively related with the profitability of banks. In Malaysian banks, the negative impact of the global financial crisis was also identified on profitability measure. (Ibe 2013) elaborated the relationship between banks profitability and liquidity management in Nigeria. The concluded results suggested that as liquidity in management increases the profitability of banks also increases. Moreover the study suggested that banks should reach the optimal level of liquidity, by engaging competent and qualified personnel to get maximum profit. In another study, Amare (2012) aimed to examine the effect of internal and external factors on the banking industry profitability in Ethiopia for the time period 2000-2011 respectively. The findings of regression analysis exhibited that internal factors significantly affected the profitability of banks, the capital, non-interest income has a positive and significant influence on profitability measures while credit risk showed a negative effect on ROA. (Syafri 2012) determined the impact of bank-specific determinants and macroeconomic determinants on the profitability of Indonesian banks. It was concluded that bank-specific determinants have a positive relationship with profitability measures. Whereas, macroeconomic determinants have a

negative relationship with banks profitability measures. Moreover, it was identified that the profitability of Indonesian banks was not affected by some of the macroeconomic factors.

2.3. Studies in Pakistan

(Ali 2015) focused on the banks' related variables and macroeconomic variables which have an impact on the profitability of the banking industry in Pakistan. The balanced panel regression technique was applied to the data for analysis. The bank related variables were factors were found to be important to need attention to develop a sound structure to control bank profitability. According to (Heggested 1977), in banks, the structure of deposits revealed that the earnings of those banks which were devoted in short and long time period deposits were found to be low, whereas, those banks which were committed to demand deposits, their earnings were found to be high. It was explored by (Smirlock 1985), that there was a significant effect of short term deposits on the profitability of banks, as they were found to be an economical source of funding.

(Tahir, Ahmad et al. 2014) examined the impact of loan loss provision on the profitability of banks. Findings showed that loans loss provision has a negative relationship with profitability measures. The increased loans loss provision showed decreased profitability. (Dawood 2014) Contributed in the literature by observing the profitability of growth of the banking industry in Pakistan. Findings of ordinary least square method indicated that bank-specific determinants contributed more in the profitability of the banking industry. (Arif, Khan et al. 2013) attempted to explore the relationship between bank profitability and bank size in Pakistan. Banks are divided into three size categories on the basis of assets. The size was found to impact positively on banks performance

3. RESEARCH METHODOLOGY

The present study has used the panel regression methods on 12 years data of fifteen banks to examine the effect of bank-specific and macroeconomic determinants on the profitability of the banking industry in Pakistan. As mentioned by (Vong and Chan

2009) regression is the technique which is generally used in the research as it provides information on the time series data and cross-sectional data.

3.1. Model specification

An equation (1) exhibits the proposed model and characteristic of the variables used in the study. The current research used explanatory variables capital, loans, deposits, inflation, size, and corporate tax. While return on assets is the dependent variable.

The current research followed the model implemented by (Athanasoglou, Brissimis et al. 2008).

The general model:

$$Y_{it} = \alpha + \beta_0 X_{it} + u_{it} \qquad (1)$$

Where

Y_{it} represents the dependent variable

B_0 = characterizes an intercept

X_{it} = describes the independent variable

   i = number of firms

   t = time period

   u_{it} = Error term

The subscript i refer to the unit of observation and t shows the time period dimension. Based on the above model, the empirical model of factors affecting banks profitability is outlined below

$$ROA = \beta 0_{it} + \beta_1 CTA_{it} + \beta_2 LTA_{it}$$

$$+ \beta_3 DTA_{it} + \beta_4 INF_{it} + \beta_5 SIZE_{it} + \beta_6 TAX_{it} \qquad (2)$$

CAT_{it} symbolizes the capital adequacy ratio for (CTA) of the firm I at given time T

LTA_{it} characterizes ratio of loans to assets (LTA) of the firm I at given time T

DTA_{it} expresses deposits to assets ratio (DTA) of the firm I at a given time

INF_{it} symbolizes annual inflation rate (consumer price index) of the firm I at given time T

$SIZE_{it}$ denote total assets base of the firm (SIZE) at given time T

TAX_{it} characterizes corporate tax for the firm I at time T

Some studies like Kosmidou et al (2007) and Van Horen (2007) proposed that Return on assets is the best measure of profitability over time since assets have a direct impact on both income and expenses.

The advantage of using pooled ordinary least square method is that it gives additional consistent estimations in the model of parameters. Under pooled ordinary least square methods, there is a constant relationship among the factors across cross-section elements.

4. RESULTS AND DISCUSSION

4.1. Model Specification Test

This section of the research exhibits the results obtained by using the regression technique, to determine the profitability of the banking industry and its determinants. The dependent variable Return on average assets (ROAA) is regressed with six independent factors occupied for the time period 2006 to 2017. From an equation (1), the main issue arises that is not mentioned that the individual effects were random or fixed, as two versions of panel statistics estimator are used in the research model. These two versions are named as the fixed effects model and Random effects model, in order to select the appropriate approach, Hausman test is used. In accordance with the Hausman test, the null hypothesis suggested that the appropriated model which should be adopted is a random effect model. If the results show the p-value less than 5% then the null hypothesis should be rejected and the alternative hypothesis should be accepted by adopting the fixed effect model. (Brooks 2008).

Table 1. Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.0000	6	1.0000

Table 5 exhibits the Hausman test which suggests that random effect model was better than fixed effects model as the chi-square statistic is 0.0000 and p-value (1.0000), which is insignificant for dependent variables which proposed that null hypothesis,

should be accepted. Therefore, the analysis is based on random effect estimates.

4.2. Redundant Fixed Effects Test

An unobserved Heterogeneity can be identified by using two methods. One of which is the Redundant Fixed effects test. The null hypothesis of this test is the effects are redundant. To study the significance of effects the redundant fixed effects likelihood ratio is performed. The output contains the significance of cross-section F statistics and cross-section Chi-square.

Table 2, Redundant Fixed Effects Test Output			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	6.232420	(14,129)	0.0000
Cross-section Chi-square	77.496104	14	0.0000

The p-values related to the F-statistic and the Chi-square statistic is together 0.0000 and intensely provides an indication in contradiction of the null hypothesis. All the results indicate that the effects are statistically significant.

4.3. Random Effects Model

This study used a random-effects model which is also termed as a variance components model. Random effect model is used to estimate the mean of a distribution of effects. Also, by using Durbin and Watson test, the first order autocorrelation can also be examined in the statistics. Durbin Watson test is used to check first-order autocorrelation, which means the association among an error and its closely preceding value. Stated by (Brooks 2008) the value of Durbin – Watson test almost equals to 2 (1-^p) where ^p is the considered as the estimated correlation coefficient between the error term and its first order lag. According to (Brooks 2008), DW has 2 acute values: higher critical value (dU) and a lesser critical value (dL), and there is also a middle area where the null hypothesis of no autocorrelation can neither be rejected nor not rejected.

Table 3, Random Effect Model				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CTA	0.077552	0.025521	3.038725	0.0029
DTA	0.008709	0.019911	0.437404	0.6626
INF	-0.014048	0.153259	-0.091662	0.9271

LTA	-0.077494	0.034385	-2.25374	0.0259
SIZE	0.526984	0.148535	3.547867	0.0005
TAX	-17.60936	17.05377	-1.032579	0.3038
C	2.401773	7.470786	0.321489	0.7484
R-squared	0.598193	Mean dependent var		0.781778
Adjusted R-squared	0.576046	S.D. dependent var		1.385365
S.E. of regression	0.902035	Akaike info criterion		2.689104
Sum squared resid	103.3357	Schwarz criterion		2.861269
Log-likelihood	-173.5145	Hannan-Quinn criteria.		2.759067
F-statistic	27.01031	Durbin-Watson stat		1.947552
Prob(F-statistic)	0.0000			

The results in Table 3 are related to the regressing ROA on the set of bank-specific variables and macroeconomic variables. From the table, R squared is 0.598193, which shows that about 59.81% of independent variables explain the dependent variable ROA while the remaining is unexplained by independent variables. The adequacy of a model as predicting is validated by the F-test. As indicated in table 3, of 135 observations, the value of F-statistics is statistically significant which has confirmed that the models applied are useful for measuring the relationship between ROA and independent variables. The overall significance of both models at 0% level of significance is indicated by F-statistics. Durbin Watson value shows that there is no issue of autocorrelation among variables as value is nearer to 2.

The results of research reveal, that, ROAA has been impacted by size positively, the relationship among size and ROAA found to be significant. Size is represented by total assets base of the bank. The resulted positive link shows that with the increase in the size of assets, the profits of banks also increases (p-value = 0.0005) It proposes that bigger banks accomplish a higher ROA. This implies that every 1% change (increase or decrease) in the bank's size keeping other things remain constant had a resultant change of 0.526984 Rs (Coefficient = 0.526984) on the profitability in the same direction. The results also indicated that the larger the banks, the more economies of scale and therefore more profitable. The reason is that the bigger banks have economies of scale and lower

variance of earnings which resulted in profitability. Also, many previous studies suggested a similarly strong significant positive relationship, for example, Goyal (2013), (Shubita and Alsawalhah 2012) were few of them.

Deposits to assets have an insignificant positive effect on ROA. (p = 0.6626). The results of the random effect model indicated that loans measured by loans to assets have a negative relationship with profitability (Return on Asset) and statistically significant (p-value = 0.0259)

Capital to assets also shows positive and significant impact on the profitability of banks (p-value 0.0029). This means that well-capitalized banks experience positive returns. This entails that if the banks have higher capital adequacy then they are able to experience more profitability growth. This result is consistent with the findings of (Hassan et al. 2003). The results are similar to (Flamini, Schumacher et al. 2009), (Naceur and Goaied 2001) and (Belayneh 2011). Similar to the findings of these authors, it is recommended that if the banks have a strong position in having capital then they can follow more business prospects more efficiently and with more flexibility in order to resolve issues which are rising from anticipated losses. Therefore banks can enhance profitability. It can be noted from results that a high level of capital adequacy leads to the high level of profitability in the Pakistani banking sector.

The inflation coefficient shows a negative and insignificant impact on ROA. The findings also suggested that as far as the limit of this factor is insignificant as indicated by high p-value (0.9271), inflation is not the determinants of growth of the banking industry in Pakistan.

In the context of the effect of inflation on ROAA, research conducted by (Demirgüç-Kunt and Huizinga 1999) revealed the positive effects and this indicates that during the period of the study, resulting in revenues that increased faster than costs, with a positive impact on profitability. Referring to previous studies, the results concerning inflation are mixed. (Demirgüç-Kunt and Huizinga 1999) identified an optimistic association among inflation rate and bank profitability. However, (Pasiouras and Kosmidou 2007) identified a negative link of the inflation rate and bank profit. An impact of corporate tax revealed a negative association with ROAA and its effect is insignificant

(p=0.3038) with coefficient value 17.60936.

4.4. Unit root test

Unit root test is the most generally used method, in which a general model may comprise of various factors which insignificantly impacted on the dependent variable. Unit root test is used in the current study in order to ensure that the time series statistics are stationary. Dickey and Fuller (1979) considered a system to examine whether the series has a unit root or not. The general specification of the dickey fuller unit root test is as follow.

$$y_t = \rho y_{t-1} + \mu_t \qquad (3)$$

Where the predictor is represented by y_t, the index for the time series expresses by t, the constant is denoted by ρ, finally, the error term is symbolized by μ_t

Method	Statistic	Prob.**	Cross-Sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.72167	0.0000	15	120
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.28921	0.0110	15	120
ADF - Fisher Chi-square	52.5612	0.0066	15	120
PP - Fisher Chi-square	50.3187	0.0115	15	135
** Probabilities for Fisher tests are computed using an asymptotic Chi				

Panel unit root test: Summary				
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.59631	0.0474	15	120

Table 4 shows the panel unit root test summary of the variables used in the study. Unit root is conducted on 15 banks over the period 2006 – 2017. The p-value of Levin, Lin & Chu test is significant as 0.0000, less than 0.05. According to the results of unit root test, the data is stationary at a level indicating that it rejects the null hypothesis, which states that Unit root exists, and the substitute hypothesis is accepted which states

stationary time series is existing meaning there is no unit root. The other p-value of Levin, Lin & Chu test is 0.0474 which is also significant and again null hypothesis is rejected.

4.5. Descriptive statistics

Table 5 shows a summary of descriptive statistics of the factors included in the regression model. These measurements are obtained to provide a total description of the data used in the model and can filter the data for any suspect numbers. Major descriptive measures are the mean, standard deviation, the minimum and the maximum values, skewness, and kurtosis of the variables for the period under study.

Variables	ROA	CTA	LTA	DTA	INF	SIZE	TAX
Mean	0.821933	8.897467	89.32793	76.87633	10.23000	19.04799	0.347000
Median	1.070000	7.365000	91.27500	79.12000	8.800000	19.41937	0.350000
Maximum	3.720000	49.49000	97.99000	88.57000	20.30000	21.52006	0.350000
Minimum	-5.41	-2.48	3.620000	0.000000	2.500000	14.71090	0.330000
Std. Dev.	1.436259	6.178955	9.490334	9.892307	4.673727	1.430820	0.006425
Skewness	-1.98	2.908418	-5.80	-3.60	0.570498	-0.75	-1.92
Kurtosis	9.621269	16.19347	48.07353	26.35317	3.053092	2.940339	5.149911
Observations	150	150	150	150	150	150	150

Findings of Table 5 show the analysis the following descriptive statistics; ROA (M= 0.821933, SD = 1.436259) as shown in Table three, the profitability of banks was measured by Return on Assets (ROA) which in turn calculated as net income divided by total assets. The mean of Return on Assets was 82% and the standard deviation is 1. This means that banks in Pakistan under the period of study, earned on average 82% return from their assets. Similarly, the mean of deposit to asset ratio of the sample banks in the study period was 76%. It reveals that total deposit represents on average 76% of assets of banks in Pakistan. The highest deposit to asset ratio for a bank in particular year was

88%. The largest standard deviation of 9 for deposits shows that deposits had more substantial change than other factors over the period.The mean of capital adequacy is 8.8% with a median of 7.36 %. The standard deviation of capital adequacy is 6.17. A high deviation of CTA with a maximum of 49.49% and minimum of -2.49%. was found. The mean size is 19.04 % with a standard deviation of 1.4. The analysis shows that the loans have the highest mean 89.32% this indicates that on average, almost 89% of total assets are kept in terms of loans. The standard deviation from mean is 9.49 and differs significantly through banks (maximum = 97.99000 and minimum = 3.620000). The huge difference between the value of maximum and value of minimum indicates that as compared to the banks with having low efficiency, the efficient banks have somewhat considerable benefit of loans because, for the commercial banks, loans and advances are said to be the major bases of interest income. The mean of inflation is 10.23% while the standard deviation is 4.67. The maximum value of inflation is 20.3% and the minimum value is 2.5%. The mean of tax is 34% and the smallest value of standard deviation for tax (0.006425) specifies that the data are gathered around the mean and consequently more consistent. This also shows that financial condition has been stable when compared to the other variable over the period.

4.6. Correlation matrix

Table 6 exhibits the correlation matrix for all the variables used in the model. Correlation analysis is the technique used to capture the extent to which two or more factors are associated with each other. Pearson product-movement measurement is the most extensively used bi-variant correlation statistics.

Table 6 Correlation Matrix of Bank Profitability and Bank-Specific and Macroeconomic Factors							
Variable	ROA	CTA	DTA	INF	LTA	SIZE	TAX
ROA	1						
CTA	-0.06335	1					
DTA	0.098208	-0.46167	1				
INF	-0.19739	0.169073	0.044047	1			
LTA	0.227231	-0.6028	0.821006	-0.02626	1		
SIZE	0.425656	-0.53243	0.359428	-0.17319	0.51799	1	

| TAX | -0.09196 | 0.174232 | -0.02546 | 0.619918 | -0.12622 | -0.23619 | 1 |

Stated by (Brooks 2008), if the y and x are being treated in a balanced way, then it will be stated that x and y are correlated with each other. But it doesn't imply that if changes occur in x this leads to making changes in y, or if changes occur in y this will make changes in x. It has been suggested that there exists a linear relationship among two variables and the movements among two variables, to the degree, provided by coefficient value.

The findings revealed from table 6 shows there is a negative correlation among the profitability measure and three profitability determinants (CTA, INF, and TAX). The remaining three determinants show the positive relationship with profitability measure included in the study. (DTA, LTA, and SIZE). Therefore it is indicated from the correlation coefficient that if the loans (LTA), deposits (DTA) and size are improved in banks, the profitability of banks will be increased. It is also suggested that, as large banks are able to produce economies of scale as compared to small banks, the size of banks should be increased, as economies of scale will lead to high profitability. Similar results were discussed by (Antoun, Coskun et al. 2018), (Bikker and Hu 2012) and (Goddard, Molyneux et al. 2004). All values of correlation results are below 0.90, therefore, multicollinearity is not a potential problem for this study. The results show a negative relation of profitability measure with some determinants as from 2006-2008 the financial crises of debt occurred and it has affected the negatively on the banking industry of European countries including Pakistan.

5. CONCLUSION

The main aim of this research was to find the bank- related and macroeconomic determinants which affect the profitability of the banking industry in Pakistan and the extent to which these factors employ influence on the Pakistani banking industry. For this purpose, the past research work was observed and it is identified that the profitability of the banking industry is commonly specified as a function of internal and external variables. Form the previous researches, the findings revealed that the profits of the

banking industry are greatly affected by the bank's related factors, however, the impact of external variables is also considerable but it is less as compared to the impact of internal determinants. This research used internal and external variables to determine their influence on the profitability of the banking industry in Pakistan for the duration of twelve years that is from 2006 to 2017. Bank size, capital adequacy, loans, and deposits were considered in the study from the context of bank-related internal determinants. While inflation rate and corporate tax were considered in the study as external determinants of profitability of the banking industry in Pakistan. This study applied suitable econometric and statistical methods to get appropriate estimates for coefficients of factors by under random effect regression analysis. Concluded results reports that there was a positive impact of SIZE on return on average assets (ROAA) and the impact was significant. There was a positive relationship gauged between capital adequacy (CTA) and ROAA which indicates that well-capitalized banks captured more profitability as compared to the banks with low capitalization. The impact of deposits (DTA) on the profitability of the banking industry was positive but the impact was found to be insignificant. Loans (LTA) showed a positive association with ROAA and their effect was significant. The negative effect of inflation was found with ROAA, and the effect was insignificant. The corporate tax was negatively related to banks profitability and its influence was insignificant.

5.1. Policy Implication

This study implies that the profitability of banks can be enhanced by increasing the capitalization of banks. Struggles should be made by banks in order to increase and maintain the retained earnings and reserves. Rather than giving extra gratuities, banks should keep retained earnings so that they can invest it in other projects. Those banks which have a high level of capitalization are capable of facing risks and unexpected fluctuations. A banking system with well-capitalization remains stable during the crisis. According to (Flamini, Schumacher et al. 2009), in sub-Saharan countries, the financial strength is achieved by implying policies of the requirement of higher capitalization. The study investigated the factors of growth of the banking industry, and it recommended that, in order to build and maintain a stable financial system, high capitalization plays an

important role.

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Appendix

Table 1: Highlights of Banking Industry

	2012	2013	2014	2015	2016	2017
	(in Billions)					
Total assets	7,117,	8,171,	9,720,	10,487,	12,106,	12,528,
Investment (net)	2,157	3,055	4,013	4,313	5,310	5,954
Advances (net)	3,358	3,349	3,805	4,110	4,447	4,336
Deposits	5,451	6,244	7,291	8,311	9,230	9,236
Equity	695	784	873	943	1,207	1,218
Profit before tax (ytd)	105	170	176	162	247	80
Profit after tax (ytd)	65	112	117	112	163	52
Non-performing loans	556	592	618	607	605	620
Non- performing loans (net)	185	182	176	139	122	123
Capital adequacy ratio (all banks) (in percent)	13.9	15.1	15.6	14.9	17.1	17.
Source: State Bank of Pakistan On the basis of calendar Year Note: Statistics of profits are on year-to-date (ytd) basis.						