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# Impact of Bank Specific and Macroeconomic Factors on Banks Profitability: A Study on Banking Sector of Pakistan

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### ABSTRACT

This research focuses and examines the association among profitability of banks, along with bank specific and macroeconomic factors of Pakistan. With the help of financial data of thirty-two Pakistani banks over the period of 2011-2015. Pooled OLS (POLS)/Random Effect, Breusch and Pagan Lagrangian Multiplier Test for Random Effects estimations and Hausman Test for Fixed vs Random effects estimations used for further empirical analysis and interpretations. Further to explore the relationship of profitability indicator ROA along with Earning per Share (EPS), SIZE, Cash Equivalents, Spread Ratio and Capital Ratio as bank specific (banking/microeconomic indicators), while on the other hand Inflation, Interest Rate and GDP as external macroeconomic factors. Statistical results to this study established confirmation that EPS, SIZE, Capital Ratio and GDP have a significant impact on the ROA of banking sector in Pakistan. The calculated results of the study are of worthy to mutually academics and banking financial policy makers.

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## 1. Introduction

Banking is considered as the backbone of economy for any country, further it is like the life blood of the current global trade and e-commerce scenario, for the reason that banks are the main foundation for supplying of funds to the trading activities to any economy. With the day by day extension of globalization and further enhancing to glocalization (a product or service that is developed and distributed globally, but is also formed and modified to accommodate the user or consumer in a local market.) it has made compulsory the efficient banking system for multinational banks as well as local banking system of any under developing country like Pakistan. The escalation and financial goals achievement of banking system majorly depends on the competitive marketing strategy. In Pakistan, commercial bank started the dominating the financial system from 1970. The financial history is changed by the nationalization of domestic banks and growth in public sector development of financial institutions. The nationalization process of banking sector from 1980 proved that economy cannot achieve the national socio-economic objectives by doing this. The non-banking financial institutions and public sector in banking was held responsible for financial incompetence, decreasing the excellence of assets and increasing threats of decreasing trend of financial institutions. Keeping in view by the end of 1990 the 90 percent of banking industry share was almost with the public-sector banks, whereas the remaining share was with the multinational foreign banks, the reason behind was that during that era domestic private banks did not exist. In addition to this high share existed for deposits, advances and savings. The significant change in the banking industry of Pakistan incurred after 1997 when banking management, administration and supervision procedure was associated with international best practices. In order to the process of privatization process of public sector banks, some noticeable changes and steps were taken. Furthermore, the ownership and concentration in banking sector is made by the development of merger and consolidation (State Bank of Pakistan, 2009).

### 1.1 Objectives of the Study

This study is major focused on the objectives and the aim to investigate the connection among bank specific factors and macro-economic indicators on bank performance in banking sector of Pakistan. On the basis of above objectives, the present study attempts to find and test the below mentioned hypothesis:

- H0: Macroeconomic factors are not significantly associated with bank specific variables and its profitability.
- H1: Macroeconomic factors are significantly associated with bank specific variables and its profitability.

## 2. Literature Review

Available literature shows that, there are so many researches available which address the bank performance through bank specific factors and macro-economic factors. This research postulate ROA as a measure of bank performance by considering the internal factor (bank specific factors) and external factors (macro-economic factors) as independent variables.

A study conducted by Gul, Irshad, and Zaman (2011) explored factors affecting Bank Profitability in Pakistan year (2005-2009) with the assistance of each bank features (internal microeconomic/bank specific and external macroeconomic factors) calculated as determining element of bank profitability in Pakistan. Above mentioned Hypotheses illustrated to examine bank's performance along with banking explicit determinants, H1 described about the micro level economic/ bank specific antecedents have considerable influence upon profitability of banks. On the other hand, H2 described that exterior macro monetary and economic factors related to banking

sector have considerable influence upon the financial performance of banks. The calculated measures proved about mentioned hypotheses recognized as well as showed considerable and important effect upon effectiveness of the banking in Pakistan.

Prosperity of Private sector banks in India with sample size of 23 banks analyzed Bhatia, Mahajan, and Chander (2012). In the findings and results Bhatia, Mahajan, and Chander (2012) concluded that following profitability measured in terms of ROA show a positive association with spread ratio, profitability measures were Business per employee, Profit per employee, Capital adequacy ratio, Credit deposit ratio and Noninterest income. Though, inverse association with profitability (ROA) against the expected relationship observed with one variable, that was, Investment deposit ratio.

Another study conducted by Kamran, Johnson and Sammer (2016) which explored factors affecting Spread Ratio as Bank Profitability in Pakistan during years 2005 to 2009 by considering bank specific characteristics and macroeconomic factors. Calculated results determined bank profitability/Spread Ratio in Pakistan. There were two hypotheses were developed for analyzing bank's profitability over specific elements, this study also proved that there is significant influence of specific/microeconomic variables on banks' effectiveness. In other words, H2 describes about external/macroeconomic factors of the banking sector is having considerable influence upon banks' productivity. Calculated measures proved about both assumptions had established size, leverage ratio and GDP having significant impact on Spread Ratio/bank profitability of the Bank's in Pakistan.

Haron (1996) calculations were the first to inspect the effects of external factors on the profitability of Islamic Banks. Results proved that, in competitive market, Islamic Banks earned more than those banks which operate in a monopolistic market. As a result, this study provided the evidence that bank profitability is measured through interest rates, inflation as well as size in both Islamic and conventional banks.

Banks' profitability During and before the International Financial Crisis study from Tunisia (North African Country) done by Rachdi (2013), in this research impact of banking related, industry related and the country wide economic elements upon effectiveness of 10 commercial banking institutes ranging financial period of 2000 to 2010 was explored in Tunisian. To test the impacts of the current financial crisis, they further divided the period into two sub periods: before the crisis (2000-2006) and during the crisis (2007-2010). Principally, they explored that, earlier than the US subprime crisis, capital adequacy, liquidity, bank size and yearly real GDP growth have a positive effect on the performance of the banking sector. Whereas, cost, income ratio, yearly growth of deposits and Inflation rate remain negatively associated with measures of bank profitability. During crisis period, bank profitability primarily explained by operational efficiency, yearly growth of deposits, GDP growth and Inflation. Their findings and empirical analysis strengthened the previous findings of other researchers for ongoing the banking sector reform programmed.

US Banking Industry explored by Hoffmann (2011), working on the Determinants of the Profitability on the banking sector. Considering the hypothesis based on the association among capital and profitability. That is, an unanticipated increase in capital tends to direct to a decrease in the bank's profitability.

Determinants of European Bank Profitability explored by Staikouras and Wood (2011) along with working on the sample size of 685 European banks including 138 large banks and 547 small banks financial data. The findings from estimated calculations recommends that bank's profitability in

Europe is not only effected to decisions of the management but to changes and deviated the external macro-economic atmosphere. This study proved that the capital strength level has significant and positive impact on banks profitability, with greater level of equity ratio leads to more profitable bank. Loan to assets ratio have negative association with bank profitability (return on assets). So, this study suggested that profitability enhances with the increase of large non-loan earning assets with compare to those banks which relay on keeping more assets with them.

Soodai and Sulha (2011) were studied under the important element of profitability of Islamic banks in the GCC Region and used the data of 44 Islamic banks of that region over the 1995-2009. The correspondence of results of the estimates of profitability among conventional and Islamic Banks strongly showed that the methods and the tools developed in the literature on conventional banking are potentially appropriate for Islamic Banking system in GCC Region.

In the study of Molyneux and Thornton (1992), they measured banking performance upon various economic regions. Their study focused 18 countries of Europe. Focus given to financial years during 1986 to 1989. Considerable relationship was found among return on equity along with the different interest rates levels of banking during the financial period.

NOUAILI, Abaoub, along with Anis (2015) worked on the determinants of Banking Performance along with Financial Changes, evidence from Trade Banks in Tunisia. The study conducted by sample size of 17 credit institutions over an era of 16 years. study analyzed and proved regarding the performance indicators progressed during the period of study, that the financial reforms didn't succeed to improve Tunisian banks performance.

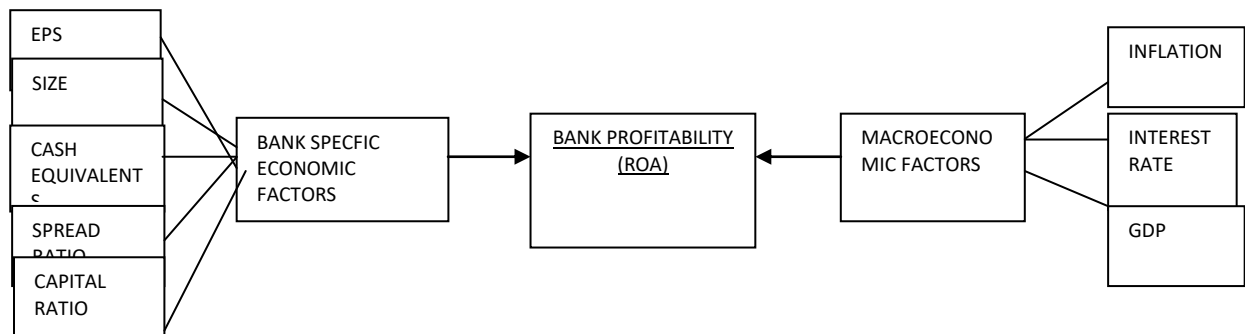
Onuonga (2014) studied the effects of bank specific/internal determinants of profitability on Kenya's top six commercial banks over the period 2008 to 2013. Their findings revealed that bank size, capital strength, bank operation expenses, ownership, and the ratio of loans to assets are the major significant determinants of the profitability of the top six Kenya commercial banks. The results also confirmed that improvement in capital strength of commercial banks leads to higher profits.

There is strong connection available among banks specific as well as macro-economic factors along with the bank's profitability in Pakistan, the above discussion confirmed. This study discourses new opening for further research in the available literature and further challenges for upgraded econometric tools and calculus for testing about the banking prosperity for the under developing countries one of them is Pakistan. Specific issued are absorbed which are related with the country and refined data accordingly in this study. Many determinants have been suggested according to the purpose and nature of study, explained in literature review for banks specific and macro-economic factors of profitability of banking sector in Pakistan.

The internal banking factors emphases on bank specific features i.e. Earnings per Share (EPS), SIZE, Cash Equivalents, Spread Ratio and Capital Ratio, while external factors consider Macro-economic factors i.e. Inflation, Interest Rate and GDP in this study.

### **3. Methodological Framework**

The model displays the factors of banks' profitability which are typically divided into bank specific and macroeconomic factors. The internal factors focus on bank specific features i.e. Earnings per Share (EPS), SIZE, Cash Equivalents, Spread Ratio and Capital Ratio, while external factors consider Macro-economic factors i.e. Inflation, Interest Rate and GDP.



### 3.1 Development of Hypothesis

We are going to check the effect of internal and external economic environment at the financial (banks) profitability.

- H0: Macroeconomic and banking specific factors are not significantly associated with bank's profitability.
- H1: Macroeconomic and banking specific factors are significantly associated with bank's profitability.
- H0a: EPS is not significantly associated with bank's profitability.
- H0b: SIZE is not significantly associated with bank's profitability.
- H0c: CASH EQUIVALENTS is not significantly associated with bank's profitability.
- H0d: SPREAD RATIO is not significantly associated with bank's profitability.
- H0e: CAPITAL RATIO is not significantly associated with bank's profitability.
- H0f: INFLATION is not significantly associated with bank's profitability.
- H0g: INTEREST RATE is not significantly associated with bank's profitability.
- H0h: GDP is not significantly associated with bank's profitability.
- H1a: EPS is significantly associated with bank's profitability.
- H1b: SIZE is significantly associated with bank's profitability.
- H1c: CASH EQUIVALENTS is significantly associated with bank's profitability.
- H1d: SPREAD RATIO is significantly associated with bank's profitability.
- H1e: CAPITAL RATIO is significantly associated with bank's profitability.
- H1f: INFLATION is significantly associated with bank's profitability.
- H1g: INTEREST RATE is significantly associated with bank's profitability.
- H1h: GDP is significantly associated with bank's profitability.

### 3.2 Data Collection and Source

This study used panel dataset that cover the period of 5 years (2011 to 2015), the sample size of 32 banks of Pakistan (appendix). The source of data was central bank website of Pakistan (State Bank of Pakistan) by using various annual reports. The macro-economic variables like Gross Domestic Product(GDP), Consumer Price Index (INFLATION) and Interest Rate were attained from World Bank website (WDI, 2015). The financial data is indicated in term of Rupees (PKR) which is given in Millions in reports. To estimate the data, we used pooled the observations across the banks and applied regression analysis by using this data.

Estimation of OLS (POLS) equation will form in this equation:

$$ROA_{it} = \alpha + \beta_1 EPS_{it} + \beta_2 SIZE_{it} + \beta_3 CASHEQ_{it} + \beta_4 SPREAD_{it} + \beta_5 CAPRATIO_{it} + \beta_6 INF_{jt} + \beta_7 INTEREST_{jt} + \beta_8 GDP_{jt} + \varepsilon_{it}$$

$$ROA_{it} = \alpha + \beta_1 EPS_{it} + \beta_2 SIZE_{it} + \beta_3 CASHEQ_{it} + \beta_4 SPREAD_{it} + \beta_5 CAPRATIO_{it} + \beta_6 INF_{jt} + \beta_7 INTEREST_{jt} + \beta_8 GDP_{jt} + \varepsilon_{it}$$

$$ROA_{it} = \alpha + \beta_1 EPS_{it} + \beta_2 SIZE_{it} + \beta_3 CASHEQ_{it} + \beta_4 SPREAD_{it} + \beta_5 CAPRATIO_{it} + \beta_6 INF_{jt} + \beta_7 INTEREST_{jt} + \beta_8 GDP_{jt} + \varepsilon_{it}$$

**Where;**

ROA= Represents Return on Assets (profitability measure)  
 EPS= Represents Earning per share.  
 SIZE= Represents natural logarithm of Total Asset  
 CASHEQ= Represents highly liquid investments  
 SPREAD= Represents average ratios of interest income to assets  
 CAPRATIO= Represents capital to assets ratio  
 INFLATION= Represents the inflation rate in economy  
 INTEREST= Represents interest rate for banking  
 GDP= Represents Gross Domestic Product

I= 32 banks  
 t= 2011-2015(5 years/ 60 months)  
 $\mu$  = error term

In this research study, all dimensions of the bank specific and macroeconomic factors on the profitability are not focused but some most important factors are included:

**3.3 Independent variables**

**EPS:** It tells shareholders how much money each share of their stock earned for the company. It is important because, usually, when a company has high earnings per share, it also has a high stock price.

**Size:** Logarithm of total assets (log C). In majority of the studies, sum of assets of bank are considered for bank size.

**Cash Equivalents:** is highly liquid investment having a maturity of three months or less. It should be at minimal risk of a change in value. Examples of cash equivalents are: Commercial paper. Marketable securities.

**Spread Ratio:** In banking, the net interest rate spread is the difference between interest earned on loans, securities, and other interest-earning assets and the interest paid on deposits and other interest-bearing liabilities.

Formula = (Interest Income/Interest Earned) x100

**Capital Ratio:** it represents the amount of assets on which shareholders have a residual claim. The figures used to calculate the ratios are taken from the company balance sheet (total equity / total assets).

**Inflation:** Inflation affects companies pricing behavior. Banks limit the Inflation and avoid deflation, to keep the economy running smoothly. If the companies expect future inflation will be

higher, they hope that they can rise their prices without effecting the demand for their production.

**Interest Rate:** is considered as amount received on the principal amount of loan, paid by borrower to the lender, rate of the principal amount in lieu of the usage of any assets. Also known as the annual percentage rate (APR).

**GDP:** GDP is market value of all goods and services a country can produce. Pakistan has less GDP rate than south region countries. GDP captures upswings and downswings manifesting in the business cycles.

### Dependent Variables

**ROA:**For the profitability measurement of any of the business is return of assets because assets generates income for the business. Securities and loans are the assets of the banks that generate income for the banks [Assets = Liabilities + Bank Capital (Owners' Equity)].

### Calculations and Data Analysis

Further is the performed analysis of our study, which includes data of 32 banks from 2011 to 2015 of Pakistan

### 3.4 Descriptive Statistics

Table 01 shows the descriptive statistics for all the variables. Mean is the centered significance of entire data or set. The mean of all dependent and independent variables is in the range of  $0.0832917 \leq \text{Mean} \leq 11.09538$  and are positive. ROA Standard Deviation is 0.0217477 which indicates that the observations in data set are closer to the Mean. The minimum and maximum ROA are -0.0567824 and 0.1038025 respectively. Total observations in our study data set are 160 (32 banks X 60 months). Further detail of variable's descriptive statistics is given.

**Table 1**

Variable	Obs.	Mean	Std. Dev.	Min	25%	Median	75%	Max
ROA	160	0.0116527	0.0217477	-0.0567824	0.0034041	0.010202	0.0184464	0.1038025
EPS	160	3.766412	5.950976	-6.32	0.265	1.685	4.28	23.93
SIZE	160	11.09538	0.7488926	8.58	10.86	11.05	11.59	12.33
CASHEQUA	160	0.0832917	0.129123	0.0000187	0.016270	0.046749	0.0871196	0.6778576
SPREAD	160	5.122857	0.8428657	0.78	4.814167	5.171094	5.54	6.193333
CAPRATIO	160	0.417623	0.7910564	0.0011845	0.0361571	0.0801343	0.5843777	3.406841
INF	160	7.810265	3.127824	2.53	7.23	7.689504	9.685054	11.91677
INTEREST	160	7.328	0.7811463	6	7.17	7.26	7.98	8.23
GDP	160	3.876	0.2348804	3.62	3.65	3.84	4.03	4.24

### Pairwise Correlation

The coefficient values indicate that if we change 1 unit in independent variable EPS, 21.27% change will be there in dependent variable (ROA). Independent variables EPS, SIZE and CAPRATIO are significant with values falling in 1% significance level respectively. Above table defines that the correlation between SIZE (Log of Total Assets) and ROA (Return on Assets) is

negative with -0.2884 and the significance level is 1%.the correlation between CASHEQUA (cash to total assets) and ROA (Return on Assets) is positive with 0.0676, the correlation between SPREAD (Income received to Income expense paid) and ROA (Return on Assets) is negative with -0.0339 as well as the correlation between CAPRATIO (total equity to total assets ) and ROA (Return on Assets) is positive with 0.3386 and significant level is 1% Same as, the correlation between INTEREST, INFLATION and GDP, and ROA is positive with 0.006, 0.0085 and 0.0144 respectively.

**Table 2**

Variable	ROA	EPS	SIZE	CASHEQUA	SPREAD	CAPRATIO	INF	INTEREST	GDP
ROA	1								
EPS	0.2127*	1							
SIZE	-0.2884*	0.5747*	1						
CASHEQUA	0.0676	-0.1496	-0.1891*	1					
SPREAD	-0.0339	-0.0452	-0.0469	0.0263	1				
CAPRATIO	0.3386*	-0.1607*	-0.6431*	0.0176	0.0062	1			
INF	0.006	-0.068	-0.0425	-0.078	0.4819*	-0.0301	1		
INTEREST	0.0085	-0.0654	-0.0381	-0.0802	0.4516*	-0.0306	0.9882*	1	
GDP	0.0144	0.0737	0.0477	0.0568	-0.4263*	0.0233	-0.8500*	-0.7816*	1

### Pooled OLS or Random Effect

For determining the pooled OLS and random effect model regression in order to test this, for testing of random effect we applied BPLM test (Breusch and Pagan Lagrangian Multiplier). The null hypothesis in the LM test is that variances crossways entities are zero. There is no major variance crosswise units (i.e. no panel effect). The command in STATA.v.14 for this test is “xttset0” type it right after running the random effects model. Breusch and Pagan Lagrangian multiplier test for random effects. The results of pooled OLS and Random effect are as under:

Table 3 shows the results of Pooled OLS and Random Effect in regression model.



**Table 3**

<b>VARIABLES</b>	<b>(Pooled OLS) ROA</b>	<b>(Random Effect) ROA</b>
<b>EPS</b>	0.00215*** (0.000320)	0.00133*** (0.000368)
<b>SIZE</b>	-0.0204*** (0.00358)	-0.0134*** (0.00438)
<b>CAPRATIO</b>	0.00145*** (0.000546)	0.00220*** (0.000644)
<b>CASHEQUA</b>	-6.75e-09*** (2.50e-09)	-7.62e-09*** (2.33e-09)
<b>INF</b>	-0.000415 (0.00519)	-1.63e-05 (0.00187)
<b>INTEREST</b>	0.00297 (0.0175)	0.00167 (0.00632)
<b>GDP</b>	0.00311 (0.0169)	0.00429 (0.00611)
<b>Constant</b>	0.201*** (0.0755)	0.128** (0.0514)
<b>Observations</b>	160	160
<b>R-squared</b>	0.333	
<b>Number of Banks</b>		32

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### **Breusch and Pagan Lagrangian Multiplier Test for Random Effects**

The probability value of this test is less than 5%. The result indicates that we will accept the null hypothesis and random effect is appropriate of this test for this model.

**Hausman Test:** This test used to determine fixed or random effect. This test basically examines whether the unique errors are correlated with the repressors'. Here we generate Ho and H1 for our study.

Ho: Difference in coefficients is not systematic

H1: Difference in coefficients is systematic

By the help of processing fixed effects model further saving the approximation, then running a random model and save the estimates, after that performed the hausman test: The estimation said that if the result is less than 0.05, use fixed effects. But according to our data set the hausman test result is 0.8773 so we used random effects.

**Random or Fixed Effect: Table 5**

<b>VARIABLES</b>	<b>(Random) ROA</b>	<b>(Fixed) ROA</b>
<b>EPS</b>	0.00133*** (0.000368)	0.00108** (0.000459)
<b>SIZE</b>	-0.0134*** (0.00438)	-0.0126* (0.00693)
<b>CAPRATIO</b>	0.00220*** (0.000644)	0.00250*** (0.000839)
<b>CASHEQUA</b>	-7.62e-09*** (2.33e-09)	-8.19e-09*** (2.61e-09)
<b>INF</b>	-1.63e-05 (0.00187)	2.83e-05 (0.00190)
<b>INTEREST</b>	0.00167 (0.00632)	0.00152 (0.00641)
<b>GDP</b>	0.00429 (0.00611)	0.00462 (0.00619)
<b>Constant</b>	0.128** (0.0514)	0.120 (0.0755)
<b>Observations</b>	160	160
<b>R-squared</b>		0.135
<b>Number of idb</b>	32	32

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Hausman Test: Fixed vs Random.**

The results of this test are as under which explore that random effect will be appropriate for this model because the criteria of fixed effect are not fulfilled. The criteria of fixed effect is If this is < 0.05 (i.e. significant) use fixed effects.

**4. Conclusion**

The research examines the brunt of banking sector specific characteristics and macroeconomic indicators upon bank's performance and profitability in banking sector of Pakistan, financial period of 2011 to 2015. Total 32 banks were selected for this purpose. Bank specific factors focused on following features i.e. Earnings Per Share (EPS), SIZE, Cash Equivalents, Spread Ratio and Capital Ratio, while Macroeconomic factors considered i.e. Inflation, Interest Rate and GDP. The characteristics of Individual bank i.e. (internal and external factors) measured the profitability of the banks. Banks having more Earning Per Share (EPS), SIZE, Cash Equivalents, Spread Ratio and Capital Ratio, Inflation, Interest Rate and GDP leads to have additional safekeeping and its benefit can be converted to obtain more profitability. To approach this, two hypotheses were developed for examining bank's Profitability over specific determinants i.e., H0: Macroeconomic and banking specific factors are not significantly associated with bank's profitability.H1: Macro-economic and banking specific factors are significantly associated with bank's profitability. The factors that have significant impact on bank's profitability (ROA) are EPS, Size, Capital Ratio and GDP. All these

four factors remain significant at 5%. It means that there are 95% chances that factors are problematic to the bank's profitability under the normal circumstances. While the other factors Cash Equivalents, Spread Ratio, Inflation and Interest Rate remain insignificant on bank's profitability which means these factors are non-problematic for the banks under normal circumstances. In closure note results suggested that in banking industry management while designing decisions regarding their future policies and profitability planning, they should consider the economic environmental factors.

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## Appendix

### Lists of Schedule Banks in Pakistan

Bank Names	IDB (Identification of Banks)
Albaraka Bank (Pakistan) Limited	1
Allied Bank Limited	2
Askari Bank Limited	3
Bank Al Habib	4

Bank Alfalah Limited	5
Bank of Khyber	6
Bank of Punjab	7
BankIslami Pakistan Limited	8
Burj Bank Limited	9
Citi Bank	10
Dubai Islamic Bank Pakistan Limited	11
Faysal Bank Ltd	12
First Dawood Investment Bank Limited	13
First Habib Modaraba	14
First National Bank Modaraba	15
First Women Bank Limited	16
Habib Bank Limited	17
Habib Metropolitan Bank Limited	18
JS Bank Limited	19
KASB Bank Limited	20
Khushhali Bank Limited	21
MCB Bank Limited	22
Meezan Bank Limited	23
National Bank of Pakistan	24
NIB Bank Ltd	25
Samba Bank Limited	26
Silkbank Limited	27
Soneri Bank Limited	28
Standard Chartered Bank (Pakistan)	29
Standard Chartered Modaraba	30
Summit Bank Limited	31
United Bank Limited	32