# Determinants of Net Interest Margin- A Study Based On Conventional Banks Of Pakistan

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**Abstract:**

*This study investigates the determinants of net interest margin of commercial banks in Pakistan that covers the period of 10 years 2006 to 2015. By using secondary data apply random effect regression to a panel of 22 commercial banks of Pakistan. The study consists of dependent variable NIM, Independent variables, control variables and macroeconomic variables. The estimation results show that operating expenses and bank deposits have positive and significant effect on net interest margin of the commercial banks in Pakistan. The study also finds that the leverage, credit risk, liquidity risk, opportunity cost, having negative and significant relationship with the net interest margin. From macroeconomic variables GDP and inflation have negative and insignificant relation with the net interest margin.*

***Keywords**:* Net Interest Margin, Leverage, Bank Deposits, Credit Risk, Liquidity Risk, Opportunity cost, Operating expense, GDP and Inflation

## Introduction

Banking sector plays an intermediary role between borrowers and lenders which reduces costs of the transaction and ultimately enhances the growth of the economy (Leland and Pyle, 1977; Diamond, 1984). Different types of factors influence the NIM of conventional banks in a different way. Angbazo (1997) observed that rate of interest risk and credit risk as determinants of NIM of commercial banks.

There is an important role of conventional banks in the growth of an economy. The basic duty of conventional banks is to receive surplus financing from the general public in the form of current, saving or fixed deposit account and lending to the public needed it (Chirwa, 2001).

In order to promote economic growth, banks play a role of intermediation at lower interest margin. Conventional banks play a very imperative role in the economic growth of the developing countries along with their capital markets (Martinez, et al 2004).

Lesser bank margin will result in a lesser social cost for financial intermediation as stated by Maudos and Guevara (2004). Lower the net interest margins reflected greater efficiency in the competitive banking system (Rudra & Ghost, 2004). Increasing the amount of bank margin will create restraint for the country's growth in terms of financial intermediation, lower deposits becomes demoralize the financial activities of saving. In Australia Faff, Hodgson and krimmer (2005) analyzed the commercial bank's data on a monthly basis and found that deregulation affects the bank operations.

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The small size of banks had higher volatility in returns while the larger size had not volatility in interest margin. Overall deregulation causes an increase in the volatility of interest margin of commercial banks.

DePrince and Morris (2007) examines the profitability of intermediation (NIM) by using the longitudinal model to find out that the bank interest rate effects on the net interest margin vary by asset class of banks. While the higher loan rates reduce saving investments for banks (Zuzana & Tigran, 2008).

According to Claeys and Vennet (2009) when commercial banks hold excess capital then banks can use capital to perform at risk and for earning more profits from financial activities which would cause an increase in the net interest rate margins. Therefore, determined or high regulatory capital ratios tend to wear away the profitability of conventional banks so that the lesser cost of capital maintaining causes increasing conventional banks' margin.

García (2010) examined both developed and developing countries to find that an operating expense is an important variable which having worth than other factors, that would be responsible for the increases in the interest margins of banks. The results also didn't establish relationships with the net interest margin and Lerner index.

Similarly, Gounder and Sharma (2012) concluded through analysis of the forty-four Kenyan banks that the net interest margin associated positively with the operating cost, credit risk, and implicit interest payments. Another side the net interest margin having a negative effect on quality management and liquidity risk and shows not significant results.

According to Doyran (2013) examine the Argentine banks to find that liquidity and leverage were important factors affecting NIM and Profits**.** NIM has a positive relationship with operating expenses. The bank carrying less leverage ratio which is measured by debt to total assets and is associated with the higher return on assets while the macroeconomic factors were found significant and positively related to NIM and negatively effects on profitability.

Another research by Nassar, Martinz, and Pineda (2014) find that the operating cost, the liquidity ratio and non-performing loans having the high provision effect on NIM of commercial banks. The ratio of credit to deposit effects the bank's NIM positively and significantly.

The different researcher found different results about the net interest margin by applying different models and different types of data to analyze the trends of commercial banks and concluded that strong banking system channels financing resources at lower costs. There is a relatively small implicit interest margin and establish a considerable share of the margin. The portion of the operating cost in the margin has been largely persistent over time (Muharrami, 2015).

Busch and Memmel (2016) concluded after analyzing the forty banks of Germany that the short run of the increase in the interest rate level causes negatively influence the NIM of the conventional banks. Hence it shows that the opposite effects which exist in the long run of the banking system while the increasing in the interest margin level leads to increase in the long run. It shows complication for the banks that loses if the interest rate rises up in the short run. At a long run, interest rate will be beneficial for the banks at a higher level.

**Target Population**

The targeted population of the current study is the commercial banks of Pakistan over the period of 2006 to 2015. According to the central bank of Pakistan, there are 22 commercial banks. The banking sector is the largest financial sector in Pakistan that can influence both the economy and GDP of Pakistan. This study also involved the macroeconomic variables like GDP and inflation.

**Study Objectives**

The aim of current study is to detect those variables which serve as factors affecting of NIM of conventional banks in Pakistan. For exploring these determinants, the researcher has used annual financial reports of banks for the period of 2006 to 2015 for micro variables and WDI for macro variables.

The findings of this study helpful for management to enhance the profitability of banks in Pakistan. It is also supportive for the policy makers to articulate the policy. The goals of this research are as follows;

1. To analyze the financial performance of banks in Pakistan.

2. To examine the determinants of the net interest margin.

3. To assess whether Leverage and deposits as determinant has effect on the relationship between the banks and the NIM?

**Research Questions**

The study determines the net interest margin on the basis of leverage and deposits, of commercial banks in Pakistan. The factors influencing the NIM analyzed by many previous researchers, but there is a big problem for the policy makers and management to adjust the bank margin on the basis of borrowing and deposits (Zhou & Wong, 2014). So that there is need that how to set the net interest margin higher, lower or according to the size of banks. So that some questions arise here are

- How to adjust the net interest margin of commercial banks?
- How would be leverage and deposits influency the NIM of Pakistani conventional banks?
- How would macroeconomic variables (GDP growth rate, inflation) influency the NIM for conventional banks in Pakistan?

**Significance of the Study**

The study emphasizes the determining factors of Net interest margin in conventional banking sector of Pakistan for the period of study 2006-15. The findings of the study will be beneficial for decision makers as well as for the policy makers in the banking industry for making appropriate decision for net interest margin. The study will empirically try to identify those factors which are responsible for an increase or decrease in the net interest margin of banks in Pakistan.

**Literature Review**

Literature review section contains the previous studies investigated the influence of determinants on the NIM. This will review the relationship of variables around the study like Leverage, liquidity risk, operating cost, deposits to assets, operating expense, and loan to the asset, GDP, and inflation of their influence on the NIM. The studies on bank interest margin determination might be traced back to Pyle in 1971, as cited in Baltens perger (1980). There are many researchers who conducted

a study regarding the the net interest margin of commercial banks for either a panel of countries or single country or a panel of countries (Molyneux & Thornton 1992, Kunt & Huizinga 1999, Abreu & Mendes 2002, & Afana sieff et al. 2002). There was no significant development in the literature on bank margin prior to 1981 (Ho & Saunders, 1981).

A lot of researchers have later tried to extend, enhance and generally adjust the model to capture another bank and country-specific variables (Ho & Saunders, 1981). According to (Zarruk, 1989) found that the risk-averse banks operate with the smaller or lower the net interest margin than the risk neutral banks. Similarly, another Wong (1997) extended the Zarruk's works by credit risk and the net interest margin into the model. He suggested that the ideal bank interest margin is higher for a risk-averse bank compared to the bank which is risk neutral.

In the USA a study Staikouras (2003) investigates the net interest rate risk and contribute the literature from the current and previous researches and found that the volatility in financial market positively or negatively on the basis of economic factors. So that the central bank's monetary policy realizes the interest rate, which affects the financial institutions. On the different countries based study Maudos & Guevara (2004) analysis the banking sector of UK, Germany, Italy, France, and Spain by using panel data and found that the net interest margin falls when an increase in the market power and decrease in the credit risk, operating cost and interest rate risk. Another study from Southeast Asian countries Doliente (2005) extended the literature and using the two models in which one is dealer model of (Ho & Sundras 1981) and another regression model. Through dealer, model concluded that the NIM as explained by factors relating to banking sectors like operating expense, liquid assets, bank capital and loan quality and from the regression analysis that the net interest margin has significant and largely explained with non-competitive structures of the commercial banking sector of Southeast Asian countries.

From Venezuelan Vera_et_al (2007) examine the determinants of the net interest margin on the basis of panel data of 24 commercial banks. Using different kinds of estimators to found that in the commercial banking sector of Venezuelan, NIM increases when operating costs, market power and expected portfolio increases. Also found that higher spread helps to strengthen the banking sector development. Further researchers found internationally NIM and Hawtrey & Liang (2008) extends the literature about the NIM using a panel of fourteen OECD countries and found that NIM internationally influenced by the credit risk, operational cost, market power, volume of loan and quality of management. . From the Mexican commercial banking sector, a research study conducted by Maudos and Solis (2009) analysed that the higher the NIM reflects the higher intermediation costs and NIM negatively effects on the growth of investment, employment, saving and economic growth. They also found that those banks which have not efficient management cause lower profit rate and higher the liabilities cost which causes the lower margin.

A research from the European Union Kasman, Tunc, Vardar & Okan (2010) about the banking sector regarding financial reforms of determinants of NIM from the period of 1995 to 2006. They found that the bank size and managerial efficiency are significantly and negatively related to the net interest margin and also found that all the macroeconomics variables are showed an insignificant relationship with NIM.

Khediri & Ben (2011) employed random effect and fixed effect techniques of panel data to investigate the factors influencing the banks' NIM in Tunisia. Results indicated that the factors like BC, OC, IIP and OCRR had a significant and positive effect on the NIM. Bank level analysis by Tatum Tan (2012) concluded that NIM in the Philippines enhances due to size of the bank,

capitalization of the bank, foreign ownership, factory overhead costs, development of stock market and rates of taxes while increase in growth, decrease in inflation, increase in reserve requirements, superior banking sector development and inferior government deficits reduce the NIM in a number of Asian economies.

To find out the major determinants of the net interest margin a study examines the spread between deposit rate and the loan rate and found that the net interest margin negatively affects the equity return and dislike the equity risk (Tasi, 2013). Another study based on management examines the bank interest spread and determine that the higher compensation to the executive body lead to higher the net interest margin. The asset size, bank concentration, and inflation show the positive relationship with the net interest margin (Mensah & Abor, 2014).

In Germany Memmel & Bundesbank (2015) analyzed the commercial banking sector from 2005 to 2014 and determine that there was a positive common relationship with higher return and higher interest margin. If the income of bank decreases, then the net interest margin decreases. Similarly, Iftikhar (2016) analyses the 76 countries banking sector on the basis of macroeconomic variables from the period of 2001 to 2005. According to his observation, NIM has a negative relationship with banking supervision and financial liberalization which is also significant. The empirical finding of the narrowing the net interest margin significant if the strong financial policies role played in banking operations.

The latest research in German based on risk and return Memmel et al (2017) investigate the commercial banking sector from the period of 2005 to 2014 and found that the higher expected risk associated typically with the higher return. In extreme situation, bank management may change its risk preference about risk and return.

**Research Gap**

The above all literature shows that previous researchers remained unable to empirically investigate the factors of NIM using data for conventional banks in Pakistan. Current study tries to include data of all commercial banks that was available from reliable resources and endeavored to fill this gap by using fresh data. Because of the researcher unable to found any research from the previous research up to the period of 2015 in Pakistan.

However, there is a need to provide evidence of analysis through fresh data that will facilitate researchers, academician and policy makers and it will help to make strategic plans for improvement of Pakistani banking sector. This study consists of selected conventional banks in Pakistan which are listed in State bank of Pakistan over the period of 10 years from 2006 to 2015.

**Data and Methodology**

Data collected through the secondary source (Consolidated annual financial reports) of commercial banks of Pakistan as well as WDI and available online at their respective websites. The commercial banking sector of Pakistan is consisting of 22 commercial banks and the researcher used the data for all these commercial banks. The time span covered in the study is 2006 to 2015. It is a short panel data due to its nature.

(Cameron and Trivedi, 2009) stated that a panel is considered to be a short panel when it has a large or many entities but few time periods. The findings of the study are applicable particular to commercial banking sector of Pakistan.

**Variables ( DV & IDV)**

Details of variables in which dependent and independent variables are given below with available detail. NIM is the dependent variable in this research paper, while the others are independent variables.

***Table No. 3.1***

| S/No | Variable Name | Measures |
|---|---|---|
| *1* | ***Net Interest Margin (NIM)*** | (Net interest Income – Net Interest Cost)/Total Assets |
| *2* | ***Bank Deposits*** | Bank Deposits / Total Assets |
| *3* | **Leverage** | Total Liability/Total Assets |
| *4* | ***Liquidity Risk*** | Liquid assets / net cash outflow |
| *5* | ***Credit Risk*** | Total loan / Total Assets |
| *6* | ***Operating Expense*** | Total non-Interest Expense / Total Assets |
| *7* | **Opportunity Cost** | Cost / Gain |
| *8* | **GDP** | GDP rate data taken from the WDI |
| *9* | **Inflation** | Inflation rate data taken from the WDI |

**Economic Modelling**

The regression model shows the dependent and independent variables regarding banks. The study used the model of (Hutapea and Kasri, 2010). The regression model and dealership approach used for the analysis of IDV and DV. The general equation shows the relationship between variables as under.

$$(NIM)_{it} = \beta_0 + \beta_1 (Lev)_{it} + \beta_2 (Dep)_{it} + \beta_3 (LTA)_{it} + \beta_4 (CR)_{it} + \beta_5 (LR)_{it} + \beta_6 (BC)_{it} + \beta_7 (OC)_{it} + \beta_8 (OPEX)_{it} + \beta_9 (GDP)_{it} + \beta_{10} (INF)_{it} + \mu_0$$

**DESCRIPTIVE STATISTICS**

The descriptive statistics shows the details of all the variables summary statistics which are included in the study as leverage, Deposits, Credit risk, Liquidity risk, Opportunity cost, Operating expense, GDP, inflation and Loan to assets ratio. It indicates the variables descriptive statistics in the form of variations (overall, between and within). In the sequence of variations, No. of observations, Mean, Standard Deviation Minimum and Maximum.

**Table 4.1**
**Descriptive Statistics**

| Variables Name | Obs. | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| **Net Interest Margin** | 220 | .0352312 | .0393682 | -.015611 | .4853625 |
| **Credit Risk** | 220 | .1157724 | .1638951 | 0.0000 | 1.906672 |
| **Liquidity Risk** | 220 | 7.257383 | 96.68289 | -354.5582 | 1112.374 |
| **Deposit Ratio** | 220 | .8259575 | .7455618 | .070106 | 7.280666 |
| **Leverage** | 220 | .9492158 | .7860258 | -.028039 | 9.393529 |
| **Operating expense ratio** | 220 | .0279187 | .0272474 | -.0512717 | .2518696 |
| **Opportunity cost ratio** | 220 | .6048873 | .1817669 | .163226 | 1.216218 |
| **Gross domestic product** | 220 | 3.71 | 1.424826 | 1.6 | 6.2 |
| **Inflation rate** | 220 | 10.24155 | 4.676288 | 2.5 | 20.3 |

## Summary of Descriptive Statistics

The researcher empirically identifies the determinants of the net interest margin along with factors affecting the overall banking sector of Pakistan. The determining factors of the net interest margin are leverage, Deposits, Credit risk, Liquidity risk, Opportunity cost, Operating expense, GDP, and inflation.

The above-given Table 4.1 indicates the descriptive statistics of the net interest margin of all commercial banks of Pakistan for the period of 2006 to 2015 (10 years) data. The table 4.1 also shows that the total number of banks which are 22 and while the observations are (22×10) = 220.

Table 4.1 also explain all the variables, in which all variables having 220 observations during the analysis period. The table shows that the determinants of the net interest margin of banks which shows the difference between interest earned and interest paid minimum value is -0.015611 and the maximum value is 0.485362. The net interest margin difference between interest paid and earned overall almost value is 48.53% which shows the average of 35% and the the net interest margin deviates with the value of 0.39368 or 39%. From the independent variables, table describes the credit risk ratio which measures the risk of default on debts with minimum value is 0.0000 or 0% and the maximum value of risk is 1.9066. The average of the credit risk shows the 11.57%. Credit risk deviates with the value of 16.38%. The results also describe that at this value there is no fear of defaults. Lower the credit risk reduces the loan losses of banks.

Similarly, liquidity risk variables in which banks are unable to meet the targets or financial demands describes the minimum value of -354.5582 and the maximum value of banks to unable meet the financial demands is 1112.3740. The average value of liquidity risk is 7.2573. Liquidity risk ratio deviates with the high value shows the descriptive Table 4.1with the value of 96.6828. Liquidity risk describes that the higher rate of liquid assets of banks which cause the lower cost of banks and lower the the net interest margin.

The deposits to total assets ratio of banks with the minimum value show the descriptive value is 0.7010 0r 70% and the maximum value of deposits to total assets ratio is 7.2806. Deposits to total asset ratio deviate from the 0.7860 and the almost average value is 0.8260 or 82.60%. The current study describes the deposits has a positive effect on the net interest margin. Higher the deposits strengthen the bank assets and lead to higher profit.

The leverage is a profitability ratio which has a minimum value of -0.354.5582 and the maximum value is 1112.3740. The leverage deviates with the value of 96.6828 and the average ratio of leverage is 7.2573. Another hand banks having operating expenses for their financial operations (like payroll, commissions, employee's benefits, pension's contributions, taxes, rent, depreciation and transportations etc.) to describe the minimum value-0.0512 or 5.12% and the maximum value of operating expenses are 0.2518 or 25.18%. Operating expense deviates with the value of 0.02724 which shows the minimum value of deviation regarding operating expense. The current study describes the lower leverage rate which causes the higher the net interest margin. Higher the leverage rate causes the lower cost and so that increases the net interest margin.

Another expense operating cost which is relating to the operation of banks describes the minimum value is 0.1632 or 16.32% and while the maximum value of operating cost is 1.2162. Operating cost deviate with the value of 0.1817 or 18.17% which shows the value greater than operating expense. The almost value of the operating expense is 0.6048.

From the macroeconomic variables GDP has the minimum value in the descriptive table is 1.6000 and the maximum value of GDP is 6.2 which is higher than average variable's maximum values. The GDP deviate with the value of 1.4248 and it also deviates with the value of 3.7100. Higher the GDP causes the higher the net interest margin because the higher banking financial activities performed during the higher GDP. Higher GDP strengthen the economic position of the country.

The other variable from the macroeconomic variables is inflation which shows the high impact on the net interest margin has minimum descriptive value 2.5 which is higher than all selected variables minimum value and the maximum value 20.3000. The maximum value of inflation shows the high impact on the the net interest margin. Inflation deviates with a higher value in Pakistan which is 4.6762. The overall average value of inflation is 10.2415.The higher inflation rate increases the the net interest margin because it also increases of cost of all operations of banks. The lower inflation rate associated with the lower cost of bank

**Correlation Analysis**

The correlation analysis of the determinants of net interest margin of commercial banks of Pakistan is given in the table 4.1.The loan to asset ratio having positive and significant association with the net interest margin. It shows the 0.0000 significance value of loan to asset ratio with the net interest margin. The loan to asset ratio having positive association value with the net interest margin is 0.6403. The credit risk shows the positive association with net interest margin having value of 0.6403. It shows according to correlation analysis that significant with net interest margin and the value is 0.0000. Credit risk also shows the positive and significant association with loan to asset ratio. Liquidity risk shows the negative association with the net interest margin with the value of -0.0093. Liquidity risk shows the 0.8910 insignificant association with the net interest margin. It also shows the negative association with loan to asset ratio and credit risk with the value of -0.0404. The significance value is 0.5516 showing in the table both the same.

**Table No 4.2**
**Correlation Matrix**

| | NIM | LTA | CR | LR | DTA | LEV | OPTEXP | OPCOST | GDP | INF |
|---|---|---|---|---|---|---|---|---|---|---|
| NIM | 1.0000 | | | | | | | | | |
| LTA | 0.6403* | 1.0000 | | | | | | | | |
| | 0.0000 | | | | | | | | | |
| CR | 0.6403* | 1.0000* | 1.0000 | | | | | | | |
| | 0.0000 | 0.0000 | | | | | | | | |
| LR | -0.0093 | -0.0404 | -0.0404 | 1.0000 | | | | | | |
| | 0.8910 | 0.5516 | 0.5516 | | | | | | | |
| DTA | 0.7033* | 0.6208* | 0.6208* | 0.0109 | 1.0000 | | | | | |
| | 0.0000 | 0.0000 | 0.0000 | 0.8724 | | | | | | |
| LEV | 0.8648* | 0.8374* | 0.8374* | 0.0007 | 0.7894 | 1.0000 | | | | |
| | 0.0000 | 0.0000 | 0.0000 | 0.9913 | 0.0000 | | | | | |
| OPTEXP | 0.7603* | 0.6232* | 0.6232* | 0.0253 | 0.5807 | 0.7419* | 1.0000 | | | |
| | 0.0000 | 0.0000 | 0.0000 | 0.7085 | 0.0000 | 0.0000 | | | | |
| OPCOST | -0.4404* | 0.0875 | 0.0875 | 0.0255 | -0.0336 | -0.0483 | -0.2065* | 1.0000 | | |
| | 0.0000 | 0.1959 | 0.1959 | 0.7074 | 0.6197 | 0.4764 | 0.0021 | | | |
| GDP | 0.0147 | 0.0688 | 0.0688 | -0.0837 | -0.0170 | 0.0365 | -0.0165 | -0.1395* | 1.0000 | |
| | 0.8282 | 0.3100 | 0.3100 | 0.2162 | 0.8019 | 0.5900 | 0.5044 | 0.0387 | | |
| INF | -0.0930 | -0.2069* | -0.2069 | 0.0471 | -0.0896 | -0.1482* | -0.0453 | 0.0884 | -0.8106 | 1.0000 |
| | 0.1704 | 0.0021 | 0.0021 | 0.4885 | 0.1867 | 0.0283 | 0.5044 | 0.1927 | 0.0000 | |

Deposits shows 0.7033 which is the positive association with the net interest margin. It shows the significant association 0.000 with the NIM. Deposits also shows the positive relationship with the loan to asset, credit risk and liquidity risk. It also shows the 0.0000 significance with loan to asset and credit risk. But it has the 0.8724 insignificant association with the liquidity risk. Leverage has positive association with the net interest margin with the value of 0.8648, and also showing the significance with the value of 0.0000. Leverage also has positive association with the loan to asset, credit risk, liquidity risk and deposits. It shows the 0.0000 significance association with the loan to asset, credit risk, liquidity risk and deposits. Operating expanse has positive association 0.7603 with the net interest margin. It has a significant association with 0.0000. Operating expanse has the positive association with other independent variables like loan to asset, credit risk, liquidity risk, deposits and leverage. It shows the significant association with 0.0000 except liquidity ratio. The insignificance association of operating expanse with the liquidity risk with value of 0.7085. The opportunity cost having negative association with the net interest margin. The association value of opportunity cost is -0.4404. It shows the 0.000 significant association with net interest margin. The opportunity cost has positive association with the loan to asset, credit risk and liquidity risk. It also has negative association with the deposits, leverage and operating expense. The 0.1959

significance with the loan to asset and credit risk. While the 0.7074 with the liquidity risk is insignificant.

Gross domestic production (GDP) has positive association 0.0147 with NIM. While the insignificance association with value of 0.8282 with net interest margin. GDP has positive assassination with loan to asset, credit risk with value 0.0688 and with leverage 0.0365. Also GDP has negative association with the liquidity risk, deposits, operating expense and opportunity cost. GDP shows the significant relate with the loan to asset ratio, credit risk, liquidity risk, deposits, leverage, operating expense and opportunity cost. Inflation has negative association with the net interest margin. Its significance value is -0.0930. The significance value with net interest margin is 0.1704. Inflation shows the negative association with all independent variables except opportunity cost. Inflation is the macro variable, so it has (0.0000) significant association with GDP. Inflation has the significant value (0.0021) with loan to asset ratio and credit risk.

## FINDINGS AND DISCUSSIONS

The regression results indicated the experimental analysis of commercial banks of Pakistan. The study determined the bank net interest margin of 10 years for the period of 2006 to 2015.The targeted population of study also shows that the total number of banks are 22 and while the researcher included the 22 banks as sample. All dependent and independent variables accept macroeconomic variables are measured from the consolidated financial statements of commercial banks of Pakistan. Macroeconomic variables GDP and inflation rate are measured through the World Development Indicator (WDI). For analysis data set made on excel and used stata software for the regression analysis. There are 220 observation made for data analysis.

| Table 4.3<br>Regression analysis--- Random affect model | | | | |
|---|---|---|---|---|
| **Ind. V** | **Coefficient** | **Std. Err** | **Z-value** | **P-value** |
| LTA | -.0322325 | .0090656 | -3.56 | 0.000 |
| LR | -0.000000182 | .0000356 | -0.05 | 0.959 |
| DTA | .0015182 | .0015581 | 0.97 | 0.330 |
| LEV | .04058 | .0026551 | 15.28 | 0.000 |
| OPT-EXP | .2555831 | .0536675 | 4.76 | 0.000 |
| OP-COST | -.0740651 | .0054745 | -13.53 | 0.000 |
| CR | -.0322325 | .0090656 | -3.56 | 0.000 |
| GDP | -.0013766 | .0008449 | -1.63 | 0.103 |
| INF | -0.00000142 | .0002621 | -0.01 | 0.996 |
| Constant | .0420064 | .0070629 | 5.95 | 0.000 |
| **Targeted Population** | | Banking sector of Pakistan | | |
| **Sample Size** | | 22 banks of financial sector of Pakistan | | |
| **Total Observations** | | 219 | | |
| **Prob > chi2** | | 0.0000 | | |
| **Corr (u_i, xb)** | | 0 | | |
| **R2 (within)** | | 0.9251 | | |
| **R2 (between)** | | 0.9050 | | |
| **R2 (overall )** | | 0.9198 | | |
| **F test that all u_i = 0** | | chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)<br>= 11.78<br>Prob>chi2 = 0.1082<br>(V_b-V_B is not positive definite) | | |

The investigator analysed both the random and fixed effect due to the nature of dataset as the panel. The Housman specification test (1978); which shows a value of Prob >chi2 = 0.1082 determined that random effect model is appropriate for this study in accordance with the suggestions by Baltagi (2005).

The estimated values for the regression model are given below:

$(NIM)_{it}$ = .0420064 + .04058 $(Lev)_{it}$ +.0015182 $(Dep)_{it}$ -.0322325 $(LTA)_{it}$ -.0322325 $(CR)_{it}$ -0.000000182 $(LR)_{it}$ -.0740651 $(OC)_{it}$ + .2555831 $(OPEX)_{it}$ -.0013766 $(GDP)_{it}$ -0.00000142 $(INF)_{it}$

The detail findings of each of variable are as follows:

**Leverage**

The above table 4.3 shows a positive and a highly significant relationship between leverage and NIM. This positive relationship between leverage and NIM has a coefficient value of 0.04058 which is significant at a p-value of 0.000. This relationship indicates that a one-unit increase in

leverage will be resulted in an increase of NIM by 0.04058. The null hypothesis is rejected and alternative hypothesis is accepted showing the same positive relationship between both variables.

**Deposits**

The table 4.3 directs a positive but insignificant relationship between deposit ratio and NIM. The coefficient value of this positive relationship between both variables is .0015182 and a p-value is 0.330. The finding of this relationship indicates that a one-unit increase in deposit ratio may cause the NIM to increase by .0015182. By this finding, the null hypothesis is rejected and alternative hypothesis is accepted showing the same positive relationship between both variables.

**Credit Risk**

The table above 4.3 directs that there is a significant and negative relationship between credit risk and NIM. The coefficient value of this negative relationship between both variables is -.0322325 and the p-value is 0.000. This finding indicates that a one-unit increase in credit risk will result in a decrease of NIM by .0322325. By this finding, we failed to reject the null hypothesis showing the same negative relationship.

**Liquidity Risk**

The table above 4.3 directs that there is an insignificant and negative relationship between liquidity risk and NIM. The coefficient value of this negative relationship is -0.000000182 and the p-value is 0.959. The finding concludes that a one-unit increase in liquidity risk may cause the NIM to decrease by 0.000000182. By this finding, we failed to reject the null hypothesis stating the same negative relationship.

**Opportunity Cost**

The table 4.3 show that there is a negative and significant relationship between opportunity cost and NIM. The coefficient value of this negative relationship between both variable is -.0740651 and the p-value is 0.000. The finding concludes that a one-unit increase in opportunity cost will decrease the NIM by .0740651. The finding further concluded that we failed to reject the null hypothesis stating the same negative relationship between both variables.

**Operating Expanse**

The table 4.3 shows that there is a positve relationship between operating expense and NIM which is significant at 1% level. The coefficient value of this positive relationship between both variable is 0.2555831 and the p-value is 0.000. A one-unit increase in operating expense will increase the NIM by 0.2555831. By this findings, the null hypothesis is rejected and alternative hypothesis is accepted showing the same positive relationship.

**GDP**

The GDP shows a negative and insignificant relationship with NIM as shown in table 4.3. The coefficient value of this negative relationship is -.0013766 and the p-value was 0.103. The finding indicates that a one-unit increase in GDP may result the NIM to decrease by 0.0013766. By this finding, we failed to reject the null hypothesis showing the same negative relationship between GDP and NIM.

**Inflation**

The finding as shown by above table 4.3 designates a negative and insignificant relationship between inflation and NIM. The value of coefficient is -0.00000142 and P-value is 0.996. A one-

unit increase in inflation may cause the NIM to decrease by 0.00000142. The finding indicates that we failed to reject the null hypothesis stating the same negative relationship.

**Loan to assets**

The table 4.3 specifies a relationship which is negative as well as significant between the ratio of loan to assets and net interest margin having a coefficient's value as -.0322325 and a P-value as 0.000. It shows that a one-unit increase in loan to assets ratio will decrease banking interest margin ratio by .0322325. The result indicate that we failed to reject the null hypothesis which states that there is a negative relationship between both the variable.

**CONCLUSION**

The findings of the study identified most imperative and determining factors in the banking sector of Pakistan for the period of study from 2006 to 2015.It revealed that leverage along with credit risk, Loan to assets opportunity cost and operating expense has a significant impact on net interest margin while deposit ratio, liquidity risk and two macro-economic factors like GDP and Inflation are not significant in the current study. The significant factors play very vital role in increasing or decreasing the conventional bank's net interest margin. Operating expenses, leverage along with deposit having a positive impact on net interest margin while credit risk, opportunity cost, loan to asset ratio having a negative impact on net interest margin in the overall banking sector of Pakistan.

The study concludes that Leverage, credit risk, opportunity cost, operating expenses and loan to asset ratio are the important and significant determining factors of net interest margin in the selected conventional banks of Pakistan. The leverage, opportunity cost and operating expenses are the determinants that increases the net interest margin while credit risk and loan to asset ratio decreases it in the conventional banking sector of the Pakistan. The policy makers and managers in the banking industry should consider these identified factors for making decision regarding the net interest margin policies in Pakistan. The future research may include some other factors that were not included in the current study due to time and other constraints.

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