# CREDIT RISK MANAGEMENT IN ISLAMIC BANKING

**Vikrant Vikram Singh***

**Naresh Kedia***

**Anima****

## ABSTRACT

This study is to determine the risk exposure of the Islamic banks in the world. The study aims at studying the functioning of the Islamic Banks, differences between the Islamic and Conventional Banks and to deduce models to manage the risk in Islamic Banks. Regression analysis is used to find the effect of various factors on the credit of Islamic Banks. Regression analysis gives us the weights of various factors on the credit of the Islamic Banks. Linear regression helps to develop equation for all the three risks defined above, and this equation can be used as a generalized model for further purposes. For the study I have taken factors such as Leverage, Capital Adequacy Ratio, Loan Loss Provisions, Natural Log of Total Assets, Proportion of Loan to Deposits, Loan Growth.

**Keywords**: Islamic Banking, Credit risk, Risk Management, Teir 1 capital, Exposure in public and Private sector

* Assistant Professor, Lovely School of Management, Lovely Professional University

** MBA( Finance), Lovely Professional University

## INTRODUCTION

Islamic Banking is an activity that confines to the Islamic Rulings of Shari'ah. These rulings prohibit the payment or acceptance of interest charges for lending and borrowing money as well as trade and other activities that involve sale and purchase of goods. Islamic banking activities must be practiced consistent with the Shari'ah and its practical application through the development of Islamic economics. Many of these principles upon which Islamic banking is based are commonly accepted all over the world, for centuries rather than decades. The principle source of the Shari'ah is The Quran followed by the recorded sayings and actions of Prophet Muhammad.

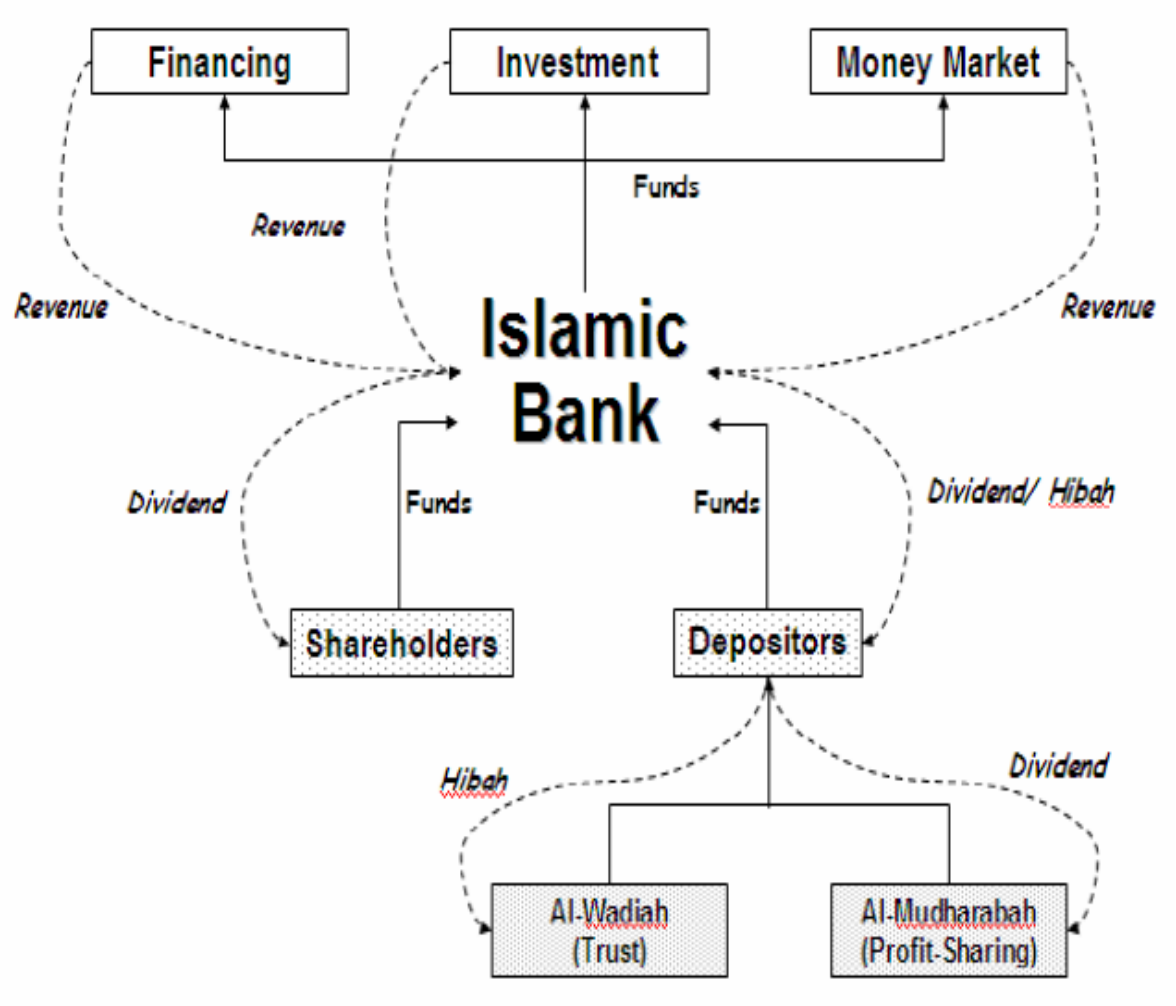


*Figure 1: Islamic Banking Business Activities*

Mudarabah is the basis of modern Islamic banking on a two-tier basis.

**1st tier:** The depositors put their money into the bank's investment account and agree to share profits with it. In this case, the depositors are the providers of the capital and the bank functions as the manager of funds.

**2nd tier:** Entrepreneurs seek finance from the bank for their businesses on the condition that profits accruing from their business will be shared between them and the bank in a mutually agreed proportion, but that any loss will be borne by the bank only. In this case, the bank functions as the provider of capital and the entrepreneur functions as the manager. According to Islam there is no possible reason why a person should enjoy an increase in wealth by the use of his money by another. As long as the owner of money is willing to become a shareholder in the enterprise and expose his money to the risk of loss, he is entitled to receive a just proportion of the profits and not merely a merely nominal share based on the prevailing interest rate.

## LITERATURE REVIEW

The inclusion of non-financial data and prototype of payment behavior in business failure can improve the certainty to manage credit in more appropriate manner.

**Al-Tamimi (2002),** in managing risk, commercial banks could follow comprehensive risk management process which includes eight steps: exposure identification; data gathering and risk quantification; management objectives; product and control guidelines; risk management evaluation; strategy development; implementation; and performance evaluation. **Bauer W, Ryser M(2004)** presented the one period model which analyzed bank regulatory restrictions , debt ratio, volatility of risky assets, size of liquidation costs and the spread between deposit rate and riskless interest rate as significant factors that compels bank hedging decision. **Mounira (2008)** established Islamic banks to be riskier than conventional banks, and argued to strengthen and support risk management practices for Islamic banks as they had less risk hedging gears accessible in the market. The paper stressed that without an efficient capital market to work within , Islamic banking finance would not continue to grow meaningfully. Since Islamic banks were prohibited of interest, it disabled the banks from using conventional risk-hedging tool such as Option, Future and Forwards. **Roshman R(2009),** stated that the the risk management practices were influenced by stakeholders of Islamic Banks namely regulator, shareholder, management team, depositor and public in generals. **Ariffin N M and Kassim S H** examined the risk practices in selected Islamic banks and the financial performance of these Islamic Banks by

using both primary as well as secondary data. All the banks considered in the study were practicing good risk management with few areas of improvement which included the use of computerized support system and more sophisticated approaches to measure risk and the use of Shari'ah compliance technique to mitigate risk. By using ROA and ROE the study showed that on average, the Islamic banks in the study performed well. The result showed that higher the ROA , the better will be the risk management practice and risk monitoring practice in Islamic Banks. Regarding ROE, banks with high ROE were biased to practice better internal control practices. **Voon-Choong Y.,Hway-Boon O.,Kok-Thim C, Yueh-Sin A.,(2010)** used Cronbach's alpha to measure the reliability of the data collected. The value came out to be 0.08983 which showed high reliability and good internal consistency. The KMO adequacy turned out to be 0.781 which indicated sufficient sampling was done. The study explained that there were five factors which were called the main factors that contributed to bank's risk exposure in the Malaysian banking scenario which were liquidity and interest factor (15% rotation sum of squared loading), domestic market factor( 14.02% rotation sum of squared loading), international market factor(12.43% rotation sum of squared loading), business operation(12.0% rotation sum of squared loading) and credit factor(10.5% rotation sum of squared loading). The bank's ablility to manage liquidity, capital adequacy, appropriation of excess reserve due to interest rate fluctuation and the impact of government control were the important aspects to commercial banking business in Malaysia. **Peter v., Peter R(2011)** reported the great impact of loan-to-value ratio with beta -0.67 and negative equity risk were main factors of default credit risk. Other variables like income factor and demographic factor showed the expected signs. **Ali K, Akhtar M F, Sadaqat S,(2011)** found out the positive relationship between bank size with financial and non-financial risk. The unusual lending of loans and sustained expenses were found to be major portion of non-financial risk faced by banks. The credit risk of the bank was significantly affected by the liquid assets whereas the operational risk was insignificantly affected by the liquid assets. The high geared ratio was attributed with the fact that the banks relies on borrowing because their major source of finance contains debt financing with the combination of equity finance. **Ahmen N., Akhtar M. H. and Usman M. (2011)** explained with the size of the bank , that was having positive and significant relationship with financial risks (credit and liquidity risk), whereas its relation with operational risk was found to be negative and statistically insignificant. **Helmy M. (2012)** found out that Islamic

Bank faced additional risk due to the nature of their balance sheet and Shariah Compliance. Non availability of financial instruments to Islamic Bank was a major hindrance in their way to manage the market risks as compared to the conventional banks.

Credit risk is deemed to be the most important type of risk faced by a bank in its relationship with the owners of wealth. It is related to the ability of a debtor to repay at the time appointed for repayment and in accordance with the conditions stipulated in the contract. If the debtor fails to abide by his obligations, it leads to a loss for the creditor and, therefore, becomes a risk for the bank. The existence of credit risk is not dependant on direct financing by the bank, like bank loans. The bank also faces this type of risk in guarantees and acceptance paper when the originator of the financial instruments owned by the bank is unable to meet his obligations (as in the case of bonds). So is the case in other indirect financing operations. Therefore, prudent bank management includes strict and detailed regulations specifically for credit risk with the purpose of managing it in a suitable manner. Conventional banks face credit risk in almost all of their operations, because the relationship between the banks and those who transact with them is that of a debtor with a creditor in all cases. Islamic banks also face this form of risk in most of the modes of financing that they use. It is well known that murabahah, istisna, and installment sale are sales with delayed payment thus generating debts in the accounts of the banks. The fundamental form of risk in all these contracts is credit risk. Salam gives rise to a commodity debt rather than a cash debt, but it also involves credit risk. Mudarabah and musharakah, on the other hand, are contracts of participation, and the funds given by the bank to entrepreneurs are not liabilities. Yet, these two also bear a credit risk in two ways. First, in the case of tort or negligence, the entrepreneur is liable to guarantee the capital which means a debt liability. Second, when the capital of mudarabah or musharakah are employed in a deferred sale, which is what takes place in most mudarabas, the owner of capital (rabb al-mal), the bank in this case, bears an indirect credit risk. This risk pertains to the ability of the counter parties to repay.

## RESEARCH METHODOLOGY

To obtain the objectives this paper uses the data of 10 Islamic Banks. Data was collected from the bank's annual reports over a period of 2009-2010. Financial data of the banks is used to analyze and calculate the credit risk of the Islamic Banks.

### Hypothesis

H 0: There is no relationship of firm's level characteristics with credit risk of the firm.

$H_1$ – There is a relationship between Leverage of a bank and credit risk.

H2 - There is a relationship between Loan Loss Provisions and credit risk of a bank.

$H_3$ - There is a relationship between Risk Weighted Assets and credit risk of a bank.

H4 - There is a relationship between Natural Log of Total Assets and credit risk of bank.

$H_5$ - There is a relationship between Proportion of Loan to Deposits and credit risk

$H_6$ - There is a relationship between Loan Growth and credit risk of a bank.

$H_7$ - There is a relationship between Capital Adequacy Ratio and credit risk of a bank.

$H_8$ - There is a relationship between Sizes of the Bank and credit risk of a bank.

$H_9$ - There is a relationship between Regulatory Capital and credit risk of a bank.

$H_{10}$ - There is a relationship between Loan Concentration in Public Sector and credit risk.

$H_{11}$ - There is a relationship between Loan Concentration in Private Sector and credit risk.

## RESULTS AND ANALYSIS

### Descriptive Statistics

| | Mean | Std. Deviation | N |
|---|---|---|---|
| CREDIT RISK | 3.0265E4 | 58750.58140 | 10 |
| Leverage | 6.2608E3 | 9875.71312 | 10 |
| LLP | 5.2614E2 | 758.61845 | 10 |
| LNTA | 16.3649 | 4.04411 | 10 |
| LTD | .5631 | .25366 | 10 |
| LG | .0959 | .65299 | 10 |
| CAR | 17.5880 | 4.82245 | 10 |
| SOB | 2.8503E4 | 26242.28871 | 10 |
| RC | 4.6907E3 | 7618.04461 | 10 |
| RWA | 3.9237E4 | 79586.46100 | 10 |
| LCPU | 6.0266E3 | 10509.82524 | 10 |
| LCPR | 3.0917E4 | 58801.56450 | 10 |

The Descriptive statistics table shows the mean, and the observation count of the variables. In this table, the data of all the 10 banks have been taken and N = 10 shows all the ten banks have been taken into consideration.

**Correlations**

| | | CREDIT RISK | Leverage | LLP | LNTA | LTD | LG | CAR | SOB | RC |
|---|---|---|---|---|---|---|---|---|---|---|
| Pearson Correlation | CREDIT RISK | 1.000 | .300 | .813 | .238 | .148 | -.009 | -.508 | .595 | .976 |
| | Leverage | .300 | 1.000 | .746 | .296 | .020 | -.162 | -.198 | .387 | .322 |
| | LLP | .813 | .746 | 1.000 | .111 | .003 | .022 | -.407 | .432 | .783 |
| | LNTA | .238 | .296 | .111 | 1.000 | .433 | -.090 | -.305 | .809 | .303 |
| | LTD | .148 | .020 | .003 | .433 | 1.000 | -.147 | .336 | .641 | .229 |
| | LG | -.009 | -.162 | .022 | -.090 | -.147 | 1.000 | .069 | -.251 | -.047 |
| | CAR | -.508 | -.198 | -.407 | -.305 | .336 | .069 | 1.000 | -.272 | -.451 |
| | SOB | .595 | .387 | .432 | .809 | .641 | -.251 | -.272 | 1.000 | .678 |
| | RC | .976 | .322 | .783 | .303 | .229 | -.047 | -.451 | .678 | 1.000 |
| Sig. (1-tailed) | CREDIT RISK | . | .200 | .002 | .254 | .342 | .490 | .067 | .035 | .000 |
| | Leverage | .200 | . | .007 | .203 | .478 | .328 | .292 | .135 | .182 |
| | LLP | .002 | .007 | . | .380 | .496 | .476 | .122 | .106 | .004 |
| | LNTA | .254 | .203 | .380 | . | .106 | .403 | .196 | .002 | .198 |
| | LTD | .342 | .478 | .496 | .106 | . | .343 | .171 | .023 | .262 |
| | LG | .490 | .328 | .476 | .403 | .343 | . | .425 | .242 | .449 |
| | CAR | .067 | .292 | .122 | .196 | .171 | .425 | . | .224 | .095 |
| | SOB | .035 | .135 | .106 | .002 | .023 | .242 | .224 | . | .016 |
| | RC | .000 | .182 | .004 | .198 | .262 | .449 | .095 | .016 | . |
| N | CREDIT RISK | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Leverage | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | LLP | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | LNTA | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | LTD | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | LG | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | CAR | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | SOB | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | RC | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

**Correlations**

| | | CREDIT RISK | RWA | LCPU | LCPR |
|---|---|---|---|---|---|
| Pearson Correlation | CREDIT RISK | 1.000 | .990 | .966 | .990 |
| | RWA | .990 | 1.000 | .945 | .999 |
| | LCPU | .966 | .945 | 1.000 | .950 |
| | LCPR | .990 | .999 | .950 | 1.000 |
| Sig. (1-tailed) | CREDIT RISK | . | .000 | .000 | .000 |
| | RWA | .000 | . | .000 | .000 |
| | LCPU | .000 | .000 | . | .000 |
| | LCPR | .000 | .000 | .000 | . |
| N | CREDIT RISK | 10 | 10 | 10 | 10 |
| | RWA | 10 | 10 | 10 | 10 |
| | LCPU | 10 | 10 | 10 | 10 |
| | LCPR | 10 | 10 | 10 | 10 |

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 1.000[a] | .999 | .995 | 4313.60343 |

a. Predictors: (Constant), RC, LG, LTD, Leverage, LNTA, CAR, SOB, LLP, RWA, LCPU, LCPR

**Model** - SPSS allows you to specify multiple models in a single regression command. This tells you the number of the model being reported. Here only 1 model is used.

**R** - R is the square root of R-Squared and is the correlation between the observed and predicted values of dependent variable. Here R = 1.

**R-Square** - This is the proportion of variance in the dependent variable which can be explained by the independent variables. This is an overall measure of the strength of association and does not reflect the extent to which any particular independent variable is associated with the dependent variable. Here R square value of 0.999 indicates that there is a 99.9% variance between the dependant and the independent variables.

**Adjusted R-square** - This is an adjustment of the R-squared that penalizes the addition of extraneous predictors to the model. Adjusted R-squared is computed using the formula 1 - ((1 - Rsq)((N - 1) /( N - k - 1)) where k is the number of predictors. Here the value is 0.995.

**Std. Error of the Estimate** - This is also referred to as the root mean squared error. It is the standard deviation of the error term and the square root of the Mean Square for the Residuals in the ANOVA table.

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 3.105E10 | 8 | 3.881E9 | 208.562 | .054[a] |
| | Residual | 1.861E7 | 1 | 1.861E7 | | |
| | Total | 3.106E10 | 9 | | | |

a. Predictors: (Constant), RC, LG, LTD, Leverage, LNTA, CAR, SOB, LLP, RWA, LCPU, LCPR

b. Dependent Variable: CREDIT RISK

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| | (Constant) | -63185.978 | 20590.714 | | -3.069 | .201 |
| | Leverage | -4.324 | .631 | -.727 | -6.850 | .042 |
| | LLP | 88.737 | 12.151 | 1.146 | 7.303 | .067 |
| | LNTA | 3941.412 | 1132.635 | .271 | 3.480 | .037 |
| | LTD | -10171.000 | 12536.598 | -.044 | -.811 | .566 |
| | LG | -11269.742 | 3152.415 | -.125 | -3.575 | .017 |
| | CAR | 413.168 | 515.779 | .034 | .801 | .570 |
| | SOB | -.009 | .275 | -.004 | -.034 | .979 |
| | RC | 1.949 | .955 | .253 | 2.040 | .029 |
| | RWA | 1.652 | 1.127 | 2.129 | 1.465 | .020 |
| | LCPU | 2.159 | .941 | .368 | 2.296 | .070 |
| | LCPR | -1.562 | 1.605 | -1.487 | -.973 | .037 |

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| | (Constant) | -63185.978 | 20590.714 | | -3.069 | .201 |
| | Leverage | -4.324 | .631 | -.727 | -6.850 | .042 |
| | LLP | 88.737 | 12.151 | 1.146 | 7.303 | .067 |
| | LNTA | 3941.412 | 1132.635 | .271 | 3.480 | .037 |
| | LTD | -10171.000 | 12536.598 | -.044 | -.811 | .566 |
| | LG | -11269.742 | 3152.415 | -.125 | -3.575 | .017 |
| | CAR | 413.168 | 515.779 | .034 | .801 | .570 |
| | SOB | -.009 | .275 | -.004 | -.034 | .979 |
| | RC | 1.949 | .955 | .253 | 2.040 | .029 |
| | RWA | 1.652 | 1.127 | 2.129 | 1.465 | .020 |
| | LCPU | 2.159 | .941 | .368 | 2.296 | .070 |
| | LCPR | -1.562 | 1.605 | -1.487 | -.973 | .037 |
| a. Dependent Variable: CREDIT RISK | | | | | | |

From the coefficients table we will develop the regression equation, which is as follows:

Y = -63185.978 + A1(-0.4324) + A2(88.737) + A3(3941.42) + A4(-10171) + A5(-11269.74) + A6(413.168) + A6(-0.009) + A7(1.949) + A8(1.652) + A9(2.159) + A10(-1.562) + E

Where A1 = Leverage.

A2 = Loan Loss Provisions.

A3 = Natural Log of Total Assets.

A4 = Loan To Deposit Ratio.

A5 = Loan Growth.

A6 = Capital Adequacy Ratio.

A7 = Size of the Bank.

A8 = Regulatory Capital.

A9 = Risk Weighted Assets.

A10 = Loan Concentration in Public Sector.

A11 = Loan Concentration in Private Sector.

E = Error Term

Credit Risk is the dependant variable in this study. Explanation of dependent and independent variables along with their proxies are specified in Annexure - 1.In addition, list of Islamic banks that are considered for this study is specified in Annexure - 2. Regression analysis is applied to study and compare the affect of independent variables on the dependent variable. SPSS is used in investigating, measuring and comparing the credit risk for Islamic banks according to their diverse individuality.

The credit risk is a very crucial factor for banks as the value of any organization measures by its credit worthiness. In model, as reported in table coefficients of the value of adjusted R-square represents that almost 99% change in the dependent variable can be observed with the variables under study while the rest of 01% is due to those factors that are not included in this study. In regression results, the credit risk is found to be a highly affected by all explanatory variables. Leverage, Loan Loss Provisions, Natural Log of Total Assets, Loan Growth, and Risk weighted assets, regulatory capital and Loan Concentration in Public and private sector found to have a positive and statistically significant relationship with credit risk at 5% and1% level respectively. Thus, this study accepts H 1, H 2, H3, H4, H6, H9, H10 and H11.The Loan to deposit ratio, size of the bank and capital adequacy ratio found to have insignificant relationship with credit risk. The regression results reports a relation but this relation is statistically insignificant, so H5, H7 and H8 are rejected. The factors such as Leverage, Loan growth and Loan concentration in Private sector negatively affect the credit risk of Islamic Banks. The factors such as Loan Loss Provisions, Natural Log of Total Assets, Risk weighted assets and the Loan Concentration in Public Sector positively affect the credit risk of Islamic Banks.

**LIMITATION**

1. Translation of Islamic Language into English was many a times not possible.
2. Some banks have not uploaded their financial results for 2009-2010.
3. The values of the factors in the study were very difficult to find from the financial statements.

## REFERENCES


- Akhtar M F, Ali K and Sadaqat S,(2011)"Liquidity Risk Management: A Comparitive Study between Conventional and Islamic Banks of Pakistan"1(1), 35-44.
- Akhtar W., Raza A., Orangzab and Akram M.(2011),"Efficiency and Performance of Islamic Bnaking",1(10),55-64.
- Al-Tamimi, H. 2002, "Risk Management Practices: An Empirical Analysis of the UAE Commercial Banks", *Finance India*, XVI,(3), (pg no1045-1057).
- Ahmed N, Akhtar M F and Usman M. (2011)."Risk Management Practices and Islamic Banks: An Empirical Investigation from Pakistan" 1(6).( 50-57).
- Bauer w, Riser M (2004)," Risk management strategies for banks." Journal of Banking & Finance 28 (2004) 331–352.
- Helmy (2012)," Risk Management in Islamic Banks."
- Mounira.(2008)," Managing Risks and Liquidity in an Interest Free Banking Framework: The Case of the Islamic Banks." 3(9).
- Peter V, Peter R(2011)," Risk Management Model: an Empirical Assessment of the Risk of Default." Issue 1.
- Rosman R(2009)," Risk Management Practices and Risk Management Processes of Islamic Banks: A Proposed Framework.".5(1).(Pg no 242-254)
- Voon-Choong Y.,Hway-Boon O.,Kok-Thim C, Yueh-Sin A.,(2010)," Factors Affecting Banks' Risk Exposure: Evidence from Malaysia" Issue (19).
- en.wikipedia.org/wiki/Islamic_banking
- Guidelines on risk management practices, by monetary authority of Singapore (2006).
- http://www.siddiqi.com/mns/RiskManagementInAnIslamicFramework.htm
- users.bart.nl/~abdul/chap4.html

## 1. ANNEXURE - 1

**List of Islamic Banks**

1. Faisal islamic bank of egypt.
2. Bank alfalah ltd. Pakistan.
3. Dubai islamic bank, dubai.
4. Al baraka, bahrain.
5. Syria international islamic bank, syria.
6. Taib, bahrain.
7. Abc islamic bank, bahrain.
8. Gulf international bank, bahrain.
9. Affin islamic bank, berhad.
10. Bank islam malaysia, berhad.

## 2. ANNEXURE - 2

**Proxies**

| | |
|---|---|
| Leverage | Debt |
| Loan loss provisions | Impariment losses |
| Risk weighted assets | Risk weighted assets |
| Natual log of total assets | Natural log of total assets |
| Proportion of loan to deposits | Loan/deposits |
| Loan growth | (loan in final year –loan in preceeding year)/loan in preceeding year |
| Capital adequacy ratio | Capital adequacy ratio ot teir 1 capital ratio |
| Size of the bank | Total assets |
| Regulatory capital | Teir 1 capital |
| Credit risk | Credit risk exposure |
| Public | Exposure in public sector |
| Private | Exposure in private sector |