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# Assessing the Effect of Asset Quality, Income Structure and Macroeconomic Factors on Insolvency Risk: An Empirical Study on Islamic Banking System of Pakistan

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## Abstract

*The current study is motivated to determine the insolvency risk in Islamic banking system of Pakistan for the years 2007 to 2015. To determine the insolvency risk in Islamic banks of Pakistan, variety of bank specific and macroeconomic variables were used to estimate the impact. The results were obtained using OLS estimation. The results reveal that asset quality of Islamic banking system does not significantly impact insolvency, whereas, interaction with CAR significantly impact asset quality. The structure of income has also no impact on insolvency, but using interaction it influence insolvency risk. Whereas, macroeconomic variables are partially significantly affecting insolvency risk, but interaction with CAR does not impact as an explanatory variable. Our study also reveals that policy makers shall focus on policy building for Islamic banks in Pakistan.*

**Keywords:** Insolvency, Islamic Banking, Macroeconomic Variables, OLS Estimation, CAR

## I. Introduction

In global financial industry Islamic banking system is the one of the fast growing segment (Hasan & Dridi, 2010). According to the report of Ernst and young 2011, around the world total Islamic financial asset are expected to have an increase of 33% from their level of 2010 to 1.1$ trillion by the end of year 2012. The fact is due to the rise of Arab spring and dissatisfaction of population with conventional banking in the world as it was seen in global financial crisis. In the region of Middle East and North Africa (MENA), the Islamic financial system has a very attractive growth trend. The growth trend can be observing as in 2010, the total asset was $416 billion and has an expectation of $990 billion until 2015. The rise in the total Islamic asset can be due to addition of countries like Tunisia and Egypt, those are opening Islamic branches.

The Islamic banking system in the region of Middle East and North Africa (MENA) over next five year has an annual growth rate of 20% with is much higher as compared to conventional banks' 9%. However, Islamic banking system remains disjointed as on average Islamic banks has only $13 billion in assets, whereas conventional has $38 billion in assets. It is observed that the segment is has lack of benign regulations and tax environment among the organization of the Islamic conference

countries will continue to pose barriers for the sector by increasing costs for Islamic financial institutions (Srairi, 2013).

In some of the countries all the financial and banking institution were converted to Islamic principles in early 1980s, like Sudan and Islamic republic of Iran. Whereas some other countries, like Indonesia, Malaysia, Pakistan, Jordan, Bangladesh and Egypt have parallel banking systems of Islamic and conventional.

In view Islamic banking system stability, the present study is motivated to estimate the stability of Islamic banks in Pakistan. In Pakistan Islamic financial and banking system is running side by side with conventional banking system. So therefore, current study is motivated to test the impact of asset quality, income structure and macroeconomic variable with insolvency risk in Islamic banking system. So, the results of the study suggest that asset quality does not produce significant relationship with insolvency risk of the bank. Other than asset quality income structure and macroeconomic factors have significant impact on insolvency risk in Islamic banking system. The rest of paper is organized as follow: section 2 background of study, section 3 methodology: section 4 results and discussion and section 5 conclusion.

## II. Background of Study

### A. Islamic Banking Sector in Pakistan

Over the past 68 years, since the inception of Pakistan, the banking system has seen many challenges and deviation. In the early stages, the sector witnessed the shortage of capital and an uncertain environment because of newly establish political government and economic condition. Over the period of time, modification was made to the function and power of state bank of Pakistan through the SBP act of 1956 to encourage the local investor to start financial and banking institutions. In addition, during 1992 the privatization of banks encouraged the local investors as well as foreign banks to invest in this sector (Ahmed, Malik, & Humayoun, 2010). The total money in circulation of Pakistan was Rs 638 billion by the year 2008 and 2009, while total asset of the sector was in total Rs. 1938 billion in 2013 to Rs, 2506 billion in 2016(Economic Survey, 2015) . The total share of Islamic banks since 2011 was Rs. 409 billion with an average growth of 15.3%. At present there are 5 Islamic and 24 public and private conventional banks are working in financial market of Pakistan (Ramzan & Zafar, 2014).

A review of the theoretical and empirical researches reveals numerous attempts to analyze the determinants of insolvency. The conflict between shareholders and mangers is influencing the risk behavior of the company, as suggested by agency theory (Jensen & Meckling, 1976). The theory argues that mangers do not seek risk as to protect personal superior position and interest, whereas, shareholders are interested in diversification of portfolio to have increased incentives by increasing the banking risk after accumulating their funds, deposits and bonds (Esty, 1998; Galai & Masulis, 1976). since, the agency problem can be eased through focused structure of ownership and shareholder with controlling rights have power to monitor managers and can replace if they have poor performance (Franks, Mayer, & Renneboog, 2001).

The literary evidence suggests that Islamic banks are more firm and sound (in view of Z score) over their entire period from 1998 to since. Whereas, the researchers have pointed out that there is no significant difference between Islamic banking and conventional banking system in term of financial crisis and banking system solvent

position (estimated through Z-score). The results were confirmed by the study of Bourkhis & Nabi, 2013, who argued that the two types of banking system are indistinguishable in terms of liquidity position and their level of nonperformig loans (asset quality). The argument by the authors were based on nonparametric approach.

The difference of asset quality in Islamic and conventional baking system is ambiguous and is not clear. This relationship is ambiguous because whether the fact in coming from equity financing in Islamic banking which provides motivations to properly measure and monitor risk. Likewise, the relationship between stability of bank and its type is not clear. On the other hand, it can be observed that the risk sharing capacity of Islamic bank may help to reduce risk. Specifically, risk of rate of interest, which is an eminent feature of risk management in conventional bank, is lacking in Islamic banking system. Furthermore, the bad selection of loan disbursement and personal hazard issues may not present in Islamic banking. In addition, Islamic banks are not permitted to involve in any risk exchanging events. This is why Islamic banking seems more even than conventional banks. Summarizing the facts, as theory do not argue the clear answers of question that how Islamic banking is different with conventional banking counterpart in term of cost efficiency, business orientation, stability and quality of assets. Whereas some of the defined differences may vary with bank size, so it has the possibility of economy of scale and diversification of tools. So, the unclear fact can be due to the products, whether following Islamic laws in full or in partial, or how they are followed country to country (Beck, Demirguc-Kunt, & Merrouche, 2013). Iannotta, Nocera, and Sironi (2007), estimates the risk and performance of 181 banks in European region. They finding were, state owned banks were having poor quality of loan and higher risk of insolvency than their private and mutual banks counterparts. While mutual fund banks pose better quality of assets and lower insolvency risk than private and public banks.

In terms of interest income and noninterest income, the importance of wholesale funding and the ratio of loan to deposit. There can be a better share of non-interest income in Islamic banking as it is possible that these banks may charge higher fees and commission to counter the loss of income from interested based activities. Furthermore, profit and loss sharing accounts cannot be characterized as loans on Islamic banks' balance sheet. While Islamic bank are not allowed to invest in non-real sector, like securities, so therefore Islamic banks focus more on investing in real lending or alike businesses (Beck, Demirguc-Kunt, & Merrouche, 2013).

Islamic laws influence the activities and structure of bank in many ways, one of the important is the exclusion of interest, or any fixed payment a giant the predetermined rate of interest. The instrument of interest in Islamic banking is changed to profit and loss sharing agreements, while the rate of return between bank and party is no know and no fixed payment is made while undertaking any transaction. So according to Errico & Farahbaksh, (1998), islmic banks differ from convnetional bank but interet rate and insolvency risk of bank has an unclear relationship.

Another factor which impedes the growth of each sector of economy is corruption. Corruption is actually use of community offices for own private gain is generally defined as corruption (Bardhan, 1997). The main form of corruption is bribe which is collected by the public officials, the misuse of public assets by the selected administrators entrusted to exploit resources in right way, manipulation of information, extortion, use of public

resources for personal use and favoritism (Andvig & Fjeldstad 2001; Swaleheen, 2011; Nguyen & Dijk, 2012). The concept of corruption is broadly accepted and understood as "any activity in which the power of public office is used to expedite for personal gain in as fact that is against the rules" (Jain, 2001). Pakistan is one of the countries which have very low score at transparency international. So the effect of corruption on Islamic banking system is not clear.

Capital regulation is designed in a way to minimize the risk behavior of owners by placing more of their personally owned wealth at risk in banking (Kim & Santomero, 1994; Laeven & Levine, 2009). Capital regulation is also designed to deal with imperfect disclosure of information to consumer and agency problem where they persist. Llewellyn (1999) highlighted that three certain factors for strength of banking, while stating to the capability of financial system to remain stable and efficient under variant market conditions. First of all, the financial system should absorb any change appears in market. Secondly, financial system must have the ability to counter financial shock that posed by external shocks which also includes macroeconomic instable environment. Third, the financial system should produce consistent stability (Milne and Whalley, 2001; Muljawan, Dar, & Hall, 2007)

## III. Methodology

The theories of financial management suggest many indexes for measuring performance of bank. Among them are financial ratios. The use of these accounting or financial ratios are common in previous research. For example, to evaluate bank performance these ratios are used by bank's regulators Korobow (1983), Booker (1983Z), Samad (1999), Patnam (1983), Sabi(1996), Meister and Elyasiani (1988), Akkas (1994), Spindler (1991) and (Samad & Hassan, 2011) used financial ratio for development and estimation of research.

The following linear model is tested using Ordinary least square (OLS). The reason to use OLS estimation is that the number of observations is less and there is no existence of autocorrelation, multicollinearity and Heteroskedasticity in data. The estimations are based on balanced panel data to estimate the insolvency risk (Z-score) of Islamic banks of Pakistan.

The study included 5 Islamic banks of Pakistan and respectively, the sample data is distributed from 2009 to 2015. This is the most available data for banking sector of Pakistan as, the first Islamic bank was started in 2002, and later licenses were given in 2006 and 2007. The data is obtained from financial reports of the banks, which are either collected from internet source or concerned offices.

$$\text{Insolvency risk} = f(\text{NPL}, \text{PNPL}, \text{ADV}, \text{INV}, \text{NONINT}, \text{GDP}, \text{INF}_{t-1}, \text{INT}, \text{CUR}_{t-1}, \text{LTA}) \quad \ldots\ldots\ldots\ldots\ldots 1$$

$$\text{Insolvency risk} = f(J_{st}, I_{yz*}\text{CAR}_{ab}) \quad \ldots\ldots\ldots\ldots\ldots 2$$

Where J is the explanatory variable for each bank s and t for time period. Whereas I is explanatory variable of each bank, with y for each bank and z for time period interaction with CAR for each bank a and time period b.

Insolvency risk = the Z-score Index

Z-score indexed ration is one of the known measure of bank stability. The index is actually inversely related to the probability of bank insolvency risk. The notion can be denoted as follows: Z=(S+K)/R where s denotes the average return on asset (ROA) of bank, K the equity capital divided by total assets and R is the standard deviation of the average return on asset (ROA) which is a proxy volatility in return. The probability of insolvency can be defined as the probability of losses which may exceed equity (Bourkhis & Nabi, 2013). So if the profit is following normal distribution, it shows like $z = \frac{ROA+CAR}{SD(ROA)}$, which is actually inverse of probability of insolvency. The Z score indicates the standard deviations that return on assets of bank has to drop before the expected value of equity start to deplete and bank becomes insolvent (see; De Nicoló, 2000; Roy, 1952; Hannan and Henwick, 1988; Boyd et al., 1993). Hence the higher value of Z-score predicts that bank is stable, whereas lower value defines instability of bank (Beck, Demirguc-Kunt, & Merrouche, 2013).

NPL= Ratio of impaired loans to total loans (annexure-1)
PNPL= Ratio of provision for impaired loans to total loans (annexure-1)
AVD= Ratio of income from advances to total loans (annexure-1)
INV= Ratio of income from investment to total loans (annexure-1)
NONINT= Ratio of noninterest income to total loans (annexure-1)
GDP= Gross domestic product growth per year of Pakistan (annexure-1)
INF= One year lag rate of inflation of Pakistan (annexure-1)
INT= Domestic interest rate for lending as per KIBOR (Karachi interbank offer rate)(annexure-1)
CUR=One year lag value of corruption index of Pakistan as per transparency international (annexure-1)
LTA= Logarithm of total assets (annexure-1)

NPL, PNPL, ADV, INV, NONINT are the bank specific variables. NPL, PNPL are the proxies of bank specific variable for asset quality. Whereas, ADV, INV, NONINT are the proxies of income structure of the banks. Other four variables includes GDP, INF, INT, CUR are the specific indicators of economics which are proxies of asset quality and structure of income of the bank.

## IV. Results and Discussion

Table 1 show the regression results on the relationship among asset quality, income structure and macroeconomic variables with insolvency risk (z-score) of Islamic banks of Pakistan. The first column of the table defines the coefficient value (β). The value of coefficient (β) defines the contribution of each independent variable with dependent variable. Whereas t-stat and p value are alternate estimation value for decision, the values produce decision for the hypothesis acceptance or rejection.

**Table 1: Simple Linear Estimation**

| Variable | Beta Coefficient | t-Statistic | P- Value |
|---|---|---|---|
| **NPL** | -0.0345 | -0.1098 | 0.9134 |
| **PNPL** | -0.1416 | -0.5212 | 0.6068 |
| **IATA** | 0.2522 | 0.5921 | 0.5591 |
| **IITA** | 0.4504 | 1.2080 | 0.2383 |
| **FBTA** | 0.2657 | 0.8519 | 0.4024 |

| | | | |
|---|---|---|---|
| **GDP** | -1.3230 | -1.8211 | 0.0806*** |
| **INF** | 1.0639 | 1.5412 | 0.1358 |
| **INT** | -0.5014 | -0.5784 | 0.5682 |
| **CUR** | 7.2587 | 2.8330 | 0.0090* |
| **LNSIZE** | 0.5008 | 2.5794 | 0.0162 |

Note: NPL=Nonperforming assets to total financing assets, PNPL= Provision for nonperforming financing to total financing, ITAT= Income from financing to total assets, IITA=Income from investment in financial assets to total assets, FBTA=Fee, brokerage and commission income to total assets, GDP= Gross domestic product growth rate, INF=Inflation rate of country, INT=Profit rate for interbank, CUR=Corruption perceptive index of country, SIZE= Natural log of total assets, ***p<0.1, **p<0.5, *p<0.01

It can be seen in the table 1 that only IITA and IR are found significant in explaining the variation in insolvency risk. Whereas NPL, PNPL, IATA,IITA, FTBA, and INFLATION are found insignificant or these are not explaining the variation in insolvency risk. However, the relationship between GDP with insolvency is found negative but significant. The relationship of CUR is positive with insolvency risk. The negative result of GDP indicates that one unit increase in GDP will reduce insolvency risk by 1.3230 units, while one unit increase in CUR will increase insolvency by 7.2587 units. Among two significant relationships CUR is contributing more in insolvency of the bank as compared to the GDP.

In order to test the interaction of CAR on the relationship with asset quality and insolvency risk of the bank, four models were tested to estimate the results. Model 1 in table two estimates the relationship of asset quality with insolvency; Model 2 estimates asset quality and CAR as independent to test relationship with insolvency. Whereas Model 3 test the relationship of asset quality CAR and an interaction of CAR and PNPL. As it can be seen in table 2, model 3 and four has AR (1). The term is applied because of auto correlation. The autocorrelation is removed using Lagrange Multiplier test

**Table 2: Interaction of CAR with NPL and PNPL**

| Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | Beta | p-value | Beta | p-value | Beta | p-value | Beta | p-value |
| **NPL** | -0.0345 | 0.9134 | -0.2021 | 0.5934 | 1.3033 | 0.0292 | -0.2425 | 0.4437 |
| **PNPL** | -0.1416 | 0.6068 | 0.1874 | 0.6005 | 0.1022 | 0.7458 | 2.4806 | 0.0007 |
| **CAR?** | | | 0.9760 | 0.0000 | 1.0836 | 0.0000 | 1.0808 | 0.0000 |
| **CAR*NPL** | | | | | -0.5525 | 0.0029* | | |
| **CAR*PNL** | | | | | | | -0.8504 | 0.0005* |

Note: ****p<0.1, **p<0.5, *p<0.01

Model 2 in table 2 includes the moderator CAR as independent. The impact of CAR is significant as independent variable. In model 3, as depicted in table 2, the interaction is applied with NPL. In model 3, the interaction of CAR with NPL is applied. The relationship of NPL*CAR is negative but significant. In model 4, the interaction of PNPL with CAR is applied. The interaction results show that, the relationship of interacting variables is significant but negative.

In order to estimate the interaction results of CAR with Income, five models were test to check the significance of CAR with income structure of Islamic banks in Pakistan as displayed in table 3. The model one test the direct impact of income structure (IATA, IITA, IFBTA) on insolvency. Second model which is model 2 includes CAR as independent in the model. Model 3 estimates the interaction of IATA with CAR, whereas

model 4 and model 5 estimates the interaction results of IITA with CAR and FBTA with CAR respectively.

**Table 3: Interaction of CAR with IATA, IITA, FBTA**

| Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Beta | p-value | Beta | p-value | Beta | p-value | Beta | p-value | Beta | p-value |
| **IATA** | 0.2521 | 0.5591 | -0.4731 | 0.3695 | 2.0663 | 0.0345 | -0.5188 | 0.2878 | -0.5871 | 0.2243 |
| **IITA** | 0.4503 | 0.2383 | 0.3963 | 0.188 | 0.14633 | 0.5945 | 3.5974 | 0.009 | 0.1985 | 0.4783 |
| **FBTA** | 0.2657 | 0.4024 | 0.7832 | 0.036 | 0.5159 | 0.1249 | 0.5807 | 0.097 | -1.4566 | 0.1051 |
| **CAR** | | | 1.3650 | 0.0005* | 1.3344 | 0.0002 | 1.4135 | 0.0001 | 1.4150 | 0.0001 |
| **CAR*IATA** | | | | | -0.8759 | 0.0039* | | | | |
| **CAR*IITA** | | | | | | | -1.2440 | 0.0164** | | |
| **CAR*FBTA** | | | | | | | | | 0.6975 | 0.0096* |

Note: ****p<0.1, **p<0.5, *p<0.01

In table 3, model 2 CAR is applied as independent variable, the impact of CAR in model 2 is significant and relationship is positive. The model 3, the interaction is applied of CAR and IATA. The impact of IATA*CAR is negative and significant. In model 4 of table 3, the interaction of CAR*IITA is applied. The relationship of interaction CAR*IITA is negative but significant. The model 5 estimate the relationship of CAR*FBTA is significant and positive.

Table 4 estimates 6 model to test the results of interaction with macroeconomic variables (GDP, Inflation, Interest rate, Corruption) with CAR. In model 1, it estimates the results of macroeconomic variables with insolvency risk of the banks. In model 2 CAR as moderator is included with macroeconomic variable. Whereas, in model 3, model 4, model 5 and model 6, the interactions of GDP with CAR, Inflation with CAR, Interest with CAR and corruption with CAR are estimated respectively.

**Table 4: Interaction of CAR with GDP, INF, INT, CUR**

| Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Beta | p-value | Beta | p-value | Beta | p-value | Beta | p-value | Beta | p-value | Beta | p-value |
| **GDP** | -1.3229 | 0.0806 | -0.2554 | 0.6783 | -1.4606 | 0.4311 | -0.4457 | 0.4734 | -0.3979 | 0.5254 | -0.3079 | 0.6299 |
| **INF** | 1.0638 | 0.1358 | -0.0775 | 0.9071 | 0.0845 | 0.9052 | -3.1138 | 0.1693 | 0.1294 | 0.8503 | 0.0366 | 0.9602 |
| **INT** | -0.5014 | 0.5682 | -0.9926 | 0.2324 | -0.6472 | 0.5047 | -0.0952 | 0.9259 | -3.4342 | 0.1419 | -0.8079 | 0.4006 |
| **CUR** | 7.2587 | 0.009 | -0.411 | 0.8276 | 1.8695 | 0.6234 | 2.8548 | 0.3367 | 3.0038 | 0.3988 | -0.7618 | 0.7184 |
| **CAR** | | | -0.347 | 0.3934 | 0.9706 | 0.6181 | 1.7701 | 0.255 | 1.9632 | 0.3462 | 0.4235 | 0.8318 |
| **CAR*GDP** | | | | | 0.3785 | 0.4897 | | | | | | |
| **CAR*INF** | | | | | | | 1.13548 | 0.1612 | | | | |
| **CAR*INF** | | | | | | | | | 1.19636 | 0.2601 | | |
| **CAR*CUR** | | | | | | | | | | | 0.5715 | 0.6932 |

Note: ****p<0.1, **p<0.5, *p<0.01

In model 3, 4, 5 and 6 interaction of CAR*GDP, CAR*INF,CAR*INT and CAR*CUR have been estimated and no significant relation has been resulted. So, on the basis of results displayed in table 4, it seems that capital adequacy ratio (CAR) do not moderate the effect of macroeconomic variables on insolvency risk of Islamic banks is Pakistan.

Bourkhis & Nabi, 2013 argued that Islamic banking system seems more stable than conventional banking system due to higher quality of assets. The fact is due to

disclosure of information and implementation of Islamic principle of lending (PLS). Disclosure of information is more prevailing fact in Islamic environment than its counter conventional banking system (Errico & Farahbaksh, 1998). These results have some relevant policy implications. Furthermore, as suggested by Abedifar et al. (2013), it is not much needed that separate supervisory and regulatory body system may be established for each type of banks as no clear difference in Islamic banking and conventional banking in terms of credit and insolvency risk. Islamic banks may be treated in similar fashion to their counter parts. However, Islamic banks pose particular kind of risk, which comes from certain features of Islamic contracts. In contrast Iqbal & Lewellyn, (2002) argues that a financial reform for harmonization of regulation, in many regions where Islamic and conventional banking system is prevailing is needed to enable sustainable and efficient growth of banking sector. Therefore, policy makers have to draw suitable prudential regulation to entice the growth and performance of Islamic banking system with their counter parts (Srairi, 2013).

Abedifar, Molyneux, & Tarazi, (2013), higlighted that on Z-score index small Islamic banks shows more stability than counterpart's conventional banks, as they are well capitalized. However, large Islamic and conventional banks have similar properties for insolvency. Quality of loan, interest expense and income of Islamic bank are not very much delicate to interest rate as compared to conventional counterpart. Whereas, Islamic banks solvency position to interest rate is much similar to conventional banks. So, author revealed that Islamic banks have significant relationship with interest rate. So, in case of Pakistan Islamic banks are not significantly influenced by domestic interest rate as displayed in table 4.

In Islamic banks, non-interest income, the proportionate of non-interest income produce a large share of total operating income which reduces the insolvency risk of the bank. Moreover, the return on deposits in Islamic banks are effect by the outcomes of the projects that a bank finance, so non-interest income reflects of the management's ability to produce positive returns on deposits (Hassan & M.Bashir, 2005). Whereas current study reveals that the structure of income has partial significant impact on insolvency. Noninterest income and income from advances are effecting on insolvency risk when they interact with CAR.

## V. Conclusion

In general, the impact of asset quality, income structure Islamic insolvency on risk exposures differs. As asset quality don not produce significant impact on Islamic bank insolvency risk, where literature argues that asset quality directly impacts on the insolvency position of conventional banks. Event against by this background, many suggestions for regulatory bodies and practitioner have been highlighted. First, asset quality does not impact Islamic banks' insolvency risk. Second, the structure of income has partial impact on insolvency risk in Islamic banking system in Pakistan. The income from PLS advance does not impact insolvency risk of baking system. Whereas, investment income and the interaction of brokerage services have partial impact on insolvency. In view of macroeconomic variables, none of the variable has significant impact on insolvency. Whereas applying the interaction of CAR with macroeconomic variables produces the positive impact on insolvency risk of Islamic banks. So therefore, the state bank of Pakistan shall work to introduce specific guideline for capital adequacy standard that should be considered for efficient performance and reduction of risk. The

guidelines should gauge the macroeconomic variable impact on bank insolvency risk for Islamic banking system of Pakistan. So, the regulatory body of Pakistan shall be motivated to produce the desired effected by reducing the constraint for capital regulation for Islamic banks.

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**Annexure -1**

| Variables | Measurements | Sources |
|---|---|---|
| Nonperforming loans/ financing to gross loans/ financing | NPL Ratio = nonperforming loans/ financing to gross loans/financing | (Kanagaretnam et al., 2004), (Fonseca & González, 2008), (Jin, Kanagaretnam, & Lobo, 2011), (Pastory & Mutaju, 2013) |
| Provision for nonperforming loans/ financing to total loans/ financing | PNPL = provision for nonperforming loans/ financing to gross loans/financing | (IMF et al., 2007), (Pasiouras, 2008), (Chiu & Chen, 2009), (Sun & Chang, 2011), (Packer & Zhu, 2012), (Pastory & Mutaju, 2013) |
| Income from Advances/ financing | Income from advances/ financing divide by total assets | (Chiorazzo, Milani, & Salvini, 2008), (Busch & Kich, 2009), (Lin, Chaung, Hsieh, & Wu, 2012), (Cheng, Zhao, & Zhang, 2014(, (Jaffar, Mabwe, & Webb, 2014) |
| Income from Investment | Income from investment divide by total assets | |
| Income from Fee & Brokerage | Nontraditional income from fee and brokerage divided by total assets | (De Young & Rice,2004) , (Stiroh, 2006), (Chiorazzo, Milani, & Salvini, 2008), (Williams & Prather, 2010), |
| GDP | Annual growth of gross domestic product in percentage | (Drehmann, Soresen, & Stringa, 2010), (Nkusu, 2011), (Ali, Akhtar, & Ahmed, 2011), (Castro, 2013), (Osamwonyi & Michael, 2014), |
| Inflation | Annual rate of consumer price index in percentage | (Ali, Akhtar, & Ahmed, 2011) (Castro, 2013), (Osamwonyi & Michael, 2014), (Wieb, Bostandzic, & Neumann, 2014) |
| Interest | Interbank lending rate KIBOR (Karachi interbank offer rate) annual bid. | (Souto, Tabak, & Vazquez, 2009) ,(Drehmann, Soresen, & Stringa, 2010), (Nkusu, 2011),(Castro, 2013), (Osamwonyi & Michael, 2014), (Washington, 2014) |
| Corruption | Corruption perception index from Transparency International | (Mo, 2001), (Gyimah-Brempong, 2002), (Swaleheen, 2011), (Park, 2012), (Nguyen & Dijk, 2012), (Farooq, Shahbaz, Arouri, & Teulon, 2013), (Bai, Jayachandran, Malesky, & Olken, 2013) |