Efficiency and Performance of Islamic Banking in Pakistan- A Stochastic Frontier Analysis

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ABSTRACT

The purpose of this study is to calculate and examine the Islamic banks operating efficiency in Pakistan. It consists of 04(four) full-fledged Islamic Banks of Pakistan. The results of Liquidity & Profitability ratios and stochastic frontier approach using data of 2004 to 2011 showed positive patterns with respect to ROE, ROA and NPR. According to the achieved results, Meezan Islamic Bank can be ranked among all other banks studied in this paper.

Keywords: *Banks performance, Islamic banks, Stochastic frontier analysis, Efficiency*

1. INTRODUCTION

The concept of Islamic banking is becoming popular not only in Islamic countries but also in the Non-Muslim countries across the globe. Islamic banking practices are based on Islamic doctrine; therefore it reduces insecurity and misuse, consequently resulting better performance and higher growth as compared to its peer conventional banking. According to Ahmed A.U., and Hassan M.K. (2007)[1], the efficiency and performance of the conventional banking is dependent on the innovation of its products/services. If conventional banks fail to innovate according to the needs and wants of the customers, it is very difficult for them too stand out in the competition.

Unlike conventional banks, the Islamic banks are designed as per the Islamic doctrine, hence its efficiency and performance is dependent on the Islamic values instead of innovation. But still this banking system is encountering challenges to apply Islamic or interest free banking system, when the world is now known as global village. As the system is in its early stages, the situation becomes more worst when Islamic banks encounter difficulties to exercise Islamic laws, as organized inter-bank money market does not provide an interest free banking platform.

There is no specific date which can be attributes as the start of Islamic banking operations. The financial transaction related to Islamic doctrines can be traced in 14th century, after the spread of Islam. However at that time, there was no office or institution which was working as a bank. Islamic banks use financial instruments such as, Mudaraba, Musharaka, Istisna etc. Quoting Khan, M., (1986) [2], conventional banking was introduced in 18th century which operates with the concept of interest, therefore the Muslim scholars and philosophers came up with a new idea and the called it Islamic Banking. This was based on the interest free system, which is the fundamental faith for Muslims in business. According to Garas, N.S., (2007) [3], nowadays the concept of Islamic banking is prevailing in many Non-Muslim countries like America, England etc. These countries not only have full-fledged operational Islamic banks, but also Islamic Banking Divisions (IBD's) attached to conventional banks.

1.1 Islamic Vs Conventional Banking

Islamic Banking
1. The operating modes & functions done in Islamic banks are based on Shariah Law.
2. Islamic banking encourages risk sharing between provider of capital i-e investor and the one who utilizes the fund i-e entrepreneur.
3. The purpose is to increases the profits but limited within Shariah restrictions.
4. The fundamental function of Islamic banks is the participation in the business. Therefore it is essential to understand the venture.
5. Islamic banks cannot charge extra money from the defaulter except for compensation, which is again given in charity.
6. Islamic banks ensure the growth with equity, as it gives importance to the public interest.
7. As the transaction is based on the sharing of profit & loss, it shows greater interest in project Development.
8. The relation is determined as partner, trader, buyer or seller.
9. Islamic banks only guarantee deposits for deposit accounts. However if the account is based on Mudaraba concept, client have to share in loss.

Conventional Banking
1. The operating modes and functions are largely based on the Capitalism Theory.
2. The conventional banks promote the guaranteed pre-determined rates of interest or returns between investors and lenders.
3. The purpose is to increase the profits; however it is done by derivative trading.
4. The fundamental function of the conventional banks is lending money with compound interest rates. Money is termed as a commodity.
5. They charge additional money from the defaulters in the form of penalty & compounded interest rates.
6. Greater importance is given to the interest of the bank. Hence no efforts are shown for growth with equity.

7. As the income from advances & loans is fixed, it gives little importance to projects. Risks are sometimes incremental with a price.

8. The relation is determined as partner, trader, buyer or seller.

9. Islamic banks only guarantee deposits for deposit accounts. However if the account is based on Mudaraba concept, client have to share in loss.
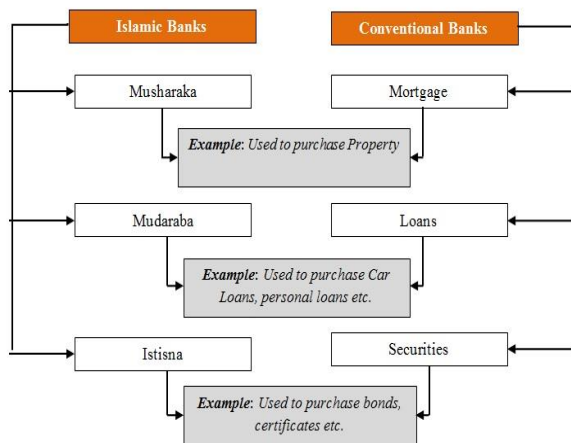

Figure 1: Differentiation of islamic and conventional banking

1.2 Objective

It is widely understood by the common people and entrepreneurs that Islamic Banks only offer finances for mortgages (Ijara). Hence the goal of this paper is to provide knowledge and analyze the efficiency and performance of different financial instruments offered by the Islamic Banks in Pakistan.

1.3 Limitations

Since Islamic Banking is a new emerging concept to understand, therefore the number of full-fledged Islamic banks is limited as compared to the conventional banking. This affected the availability of centralized data (few observations). The study only consists of the data from the following 4 full-fledged Islamic banks only:

- Meezan Bank Limited
- Bank Islami Pakistan Limited
- Al Barka Bank Pakistan Limited
- Dubai Islamic Bank Limited

2. THEORETICAL FRAMEWORK

According to Moody's, 2008; the share of investments in the market by the banks has increased up to 15% in the recent 10 years across the world. Also the growth of Islamic banking across the world as one of the determinants of this phenomenal industry growth. Khan, M. (1986) [2], Khan, M. & Mirakhor, A. (1987) [4], Dar, H., (2003) [5], identified interest free system as the underlying principle of such growth. Citing Stefflar, W., & Cornilisse, P. (1995) [6], identified that the characteristics of Islamic banking are diverse from conventional banking in Pakistan. However the effect of Islamic banks is moderate on the business sector, as they are similar to conventional banking and are governed by State Bank of Pakistan. Garas N.S., (2007) [3], research results classified two major challenges for Islamic Banks i-e internal and external. He further elaborated internal challenge as customers who are familiar with conventional banking products for long, and externally he stated that it is hard for Islamic banks to explore that Islamic financial institution facing two types of challenges i.e. internal and external. The internal challenge is to involve those customers who are using conventional banking products whereas external challenge is the execution of international transactions due to the lacked Islamic regulatory frame-work. Therefore it is the need of the time to increase the awareness of Shariah knowledge and training of Islamic products, in order to be successful internationally. Khan, M., (1986)[2], El-Din, S., & Abdullah, N.I. (2007)[7], also highlighted that Islamic banking should utilize the skills of Shariah scholars to review the Shariah related problems for the effective operation of local and international problems. El-Din, S., & Abdullah, N.I. (2007)[7], also highlighted the importance of Shariah frame-work to execute the Islamic transactions in the presence of both banking systems i-e Islamic and Conventional.

The study conducted by Hameed, A., & Bashir, M. (2003)[8], on the determinants of profitability disclosed that the profitability of banks has a correlation with the sources of the funds. They further explain that the financial instruments used in Islamic banking operations are effected by inflation and interest rate however no noticeable diversification was observed on the earning of the banks. However the future of these banks can be challenged by the missing appropriate protection framework. Ahmed A.U., and Hassan M.K. (2007)[1], studied the performance of Bangladesh Islamic Banks and revealed that, the performance is also effected by inter-bank money market and legal requirement of the reserve. He suggested that an independent act should be introduced for the management, administration, direction, performance and operations of Islamic Banks to offer support to its stake-holders. Financial ratios are also one of the key indicators which are used to analyze the performance of banks. Saleh, A.H., & Zeitun, R. (2006) [9], used liquidity, profitability, solvency & efficiency ratios to measure the performance of Jordan Islamic Bank and Islamic International Arab Bank in Jordan. They revealed that the profitability of the bank increased to the significant levels by financing the short-term ventures. Samad, A., (2004)[10], compared the performance of Islamic and conventional banks after the Gulf War (1999-2001) in Bahrain and found a significant difference of credit performance i-e the credit performance of Islamic banks was lower than that of conventional banks. Kader, J.M., et. al. (2007) [11], also compared the performance of Islamic and conventional banks using their balance sheets and income statement from 2000-2004. The results achieved showed that conventional banks were less profitable, more risky and less efficient to its counterpart. The reason identified for this behavior was the Saving P&L principle, adopted by Islamic banks.

Management ratios along with financial ratios have been used by many researchers like Al-Jarrah, I., & Moulyneux, P. (2003)[12], Hussein, K., (2004)[13], Samad, A., (1999)[14], & Yudistira, D, (2004)[15], to analyze the performance and efficiency of banks using multiple approaches. Roger, K.E., (1998)[16], & Mester, L.J., (2007)[17], used SFA (Stochastic Frontier Approach) to measure the efficiency of the Islamic banks. The SFA is less receptive to the errors and outliers in reducing the costs by taking the trans-log of inputs and outputs. Mokhtar, H.S., et. al. (2006) [18], used the same SFA approach to study the efficiency of Malaysian Islamic banks. Their findings supported the facts that the performance of the Islamic banks increase for the study period whereas, it remained stable for conventional banks. However conventional banks showed high level of competence, as they offer a wide range of products. After studying the literature on the performance and efficiency of Islamic banks across the world, it can be concluded that Islamic banks show less risky behavior, highly efficient and more stable than the conventional banks. The current study will base on studying the estimation of efficiency and the performance of major Islamic banks in Pakistan.

3. RESEARCH DESIGN

According to Governor SBP (State Bank of Pakistan) Yaseen Anwer there are 48 public, private and foreign banks with 10,600 branches operating across Pakistan, out of which only 5 banks with 838 branches are full-fledged Islamic Banks by the year 2014. The study excludes the banks having IBD's (Islamic Banking Divisions) as these banks are practicing both Islamic & conventional banking methodology. It only includes the above 5 mentioned full-fledged Islamic Banks as they have similar products and services offered to the consumers. The sample is taken from the year 2004 to 2011 which makes 8 years in total.

4. METHODOLOGY

The goal is to make the most of the value of share-holders equity by maximizing profitability of the Islamic banks. And in order to achieve this goal, a broad strategy has been considered to identify the objective and strategy. While assessing the banks performance, the internal and external elements are very crucial. However it

is easy to keep a track of performance via internal factors with the help of profitability ratios.

The study consists of two components i-e Performance and Efficiency of Islamic Banks in Pakistan. In order to analyze the performance of the Islamic Banks, we have used the liquidity and profitability ratios. According to studies, to measure efficiency, three methods are normally used i-e SFA (Stochastic Frontier Analysis), TFA (Thick Frontier Approach) and DFA (Distribution Free Approach). Out of these three we have selected SFA because the accuracy of results with SFA is high as compared to other two models. The frontier function used for this study is Cobb-Douglas form and assumes stable elasticity of substitution in inputs. The list of the ratio is as under:

Liquidity Ratios
a)   Debt-to-Equity (DOE) = $\dfrac{\text{Total Liabilities}}{\text{Owners' Equity}}$

b)   Quick Ratio (QR) = $\dfrac{\text{Quick Assets}}{\text{Current Liabilities}}$
Whereas; Quick Assets = Total Current Assets – Inventory

Profitability Ratios
a.   Return on Net Worth Ratio (RNW)

$$= \frac{\text{Net Profit (After Taxes)}}{\text{Owners' Equity}}$$

b.   Return on Assets (ROA)

$$= \frac{\text{Net Profit (After Taxes)}}{\text{Total Assets of Bank}}$$
This ratio indicates the profitability of the bank.

4.1 Stochastic Frontier Analysis
The study has utilized 03 input and 08 output variables to determine the results. The dependent variables are; Return on Equity (ROE), Return on Assets (ROA) and Net Profit (NP). The independent variables and there expected outcome is classified in the *Table 1* below:

Table 1: Input variables & expected outcome	
Independent Variables	**Outcome**
Net Income -to- Total Debt Ratio (NIDR)	*+ve to Net Profit Ratio* *+ve to Return on Equity Ratio* *+ve to Return on Asset Ration*
Investment -to- Deposit Ratio (IDR)	*-ve to Net Profit Ratio* *-ve to Return on Equity Ratio* *-ve to Return on Asset Ration*
Capital Adequacy Ratio (CAR)	*-ve to Net Profit Ratio* *-ve to Return on Equity Ratio* *+ve to Return on Asset Ration*
Musharaka (MS)	*-ve to Net Profit Ratio*

	-ve to Return on Equity Ratio
	-ve to Return on Asset Ration
Mudaraba (MD)	-ve to Net Profit Ratio
	-ve to Return on Equity Ratio
	-ve to Return on Asset Ration
Istisna (FS)	-ve to Net Profit Ratio
	-ve to Return on Equity Ratio
	-ve to Return on Asset Ration
Finance Advance -to- Deposit Ratio (FDR)	+ve to Net Profit Ratio
	+ve to Return on Equity Ratio
	+ve to Return on Asset Ration
Banking Environment (BE)	# of Branches

4.2 Econometric Model

The research will investigate three (03) outputs individually incorporated with inputs while using SFA methodologies.

The ROA (Return on Assets) model is:

$ROA_t = \delta + \delta_1 NIDR_t + \delta_2 IDR_t + \delta_3 CAR_t + \delta_4 MS_t + \delta_5 MD_t + \delta_6 IS_t + \delta_7 FDR_t + \delta_8 BE_t + \rho_t$

The ROE (Return on Equity) model is:

$ROE_t = \delta + \delta_1 NIDR_t + \delta_2 IDR_t + \delta_3 CAR_t + \delta_4 MS_t + \delta_5 MD_t + \delta_6 IS_t + \delta_7 FDR_t + \delta_8 BE_t + \rho_t$

The NP (Net Profit) model is:

$NP_t = \delta + \delta_1 NIDR_t + \delta_2 IDR_t + \delta_3 CAR_t + \delta_4 MS_t + \delta_5 MD_t + \delta_6 IS_t + \delta_7 FDR_t + \delta_8 BE_t + \rho_t$

Where $_t$ = number of years i-e 8

5. RESULTS & DISCUSSION
5.1 Descriptive Statistics

Return on Assets is the measurement of the utilization of the assets to make profits by the bank. Normally the finances for the purchasing of such assets come from both the debt and equity. According to the above results in Table 2, all the banks has shown positive growth. Especially Albarka Bank Pakistan Limited which has increased growth from 86% to 245% from the year 2010 to 2011.

Opposite to Return on Assets (ROA), the Return on Equity (ROE) is the calculation of net income the bank has generated from shareholders equity. The studies in Table 2, above show that Meezan Bank has uniform growth as compared to all other 3 banks. They have positive ROE however it predicts non-consistent ROE.

Net Profit Ratio (NPR) is the measurement of the profit the firm has generated for every Hundred Rupee Sale. It is also the calculation of the gross profit of the bank and a high ratio shows that the assets and the funds were managed and invested efficiently and effectively. According to the results in *Table 2* above, except Bank Islami Ltd. all other banks predicted a positive and uniform efficiency below:

Table 2: Descriptive statistics of profitability ratio analysis								
Meezan Bank Ltd.	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
ROA	0.55	0.98	1.07	1.18	1.43	1.77	1.84	1.93
ROE	6.12	10.29	12.57	15.64	17.21	18.88	21.64	28.18
NPR	4.21	6.68	6.9	7.23	8.27	8.76	11.17	16.51
Bank Islami Ltd.	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
ROA	0.43	0.2	1.56	0.25	0.33	1.84	0.12	1.79
ROE	0.33	0.63	0.81	1.012	1.33	9.93	0.99	8.29
NPR	4.16	8.06	11.33	8.65	25.01	44.67	2.28	31.29

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Al Barka Bank Ltd.	2004	2005	2006	2007	2008	2009	2010	2011
ROA	0.06	0.13	0.27	0.38	0.45	0.86	1.9	2.45
ROE	0.06	0.13	0.27	0.38	0.45	0.86	1.9	2.45
NPR	55.36	75.89	132.67	155.35	180.64	121.35	119.4	124.16
Dubai Islamic Bank Ltd.	2004	2005	2006	2007	2008	2009	2010	2011
ROA	0.13	0.89	1.01	1.12	1.27	1.45	1.47	1.35
ROE	1.21	9.19	13.57	15.83	19.02	16.93	19	17.42
NPR	1.86	6.03	7.23	9.84	11.95	16.88	18.1	14.44

Table 3 below, the financial instruments that Islamic Banks use to offer to its consumers. Three major financial instruments has been studied i-e Musharaka, Mudaraba and Istisna. Musharaka replaced house financing or Mortgage, Mudaraba replaced over-draft & short-term loans and Istisna replaced SME Loans or business loans. According to the *Table 3*, all the banks showed positive growth in all the financial instruments listed in the table below, however Bank Islami Ltd. showed negative growth in Musharaka and Istisna in the year 2009-2010 and same pattern followed for Mudaraba in the year 2010-2011.

5.2 Efficiency Calculations for Profitability

Efficiency Mean of ROA (All Banks): **0.982005**
Efficiency Mean of ROE (All Banks): **0.914797**
Efficiency Mean of NP (All Banks):   **0.772354**

According to Table 4, the results show that Islamic Banks are highly efficient in Pakistan except the Net Profit. The efficiency of ROA is 98.2% followed by 91.4% efficient on ROE. However the Net Profits of all banks are 77.2% efficient. This is because of the factor that many conventional banks also offer Islamic Banking Divisions (IBD's) which result in the splitting of market share.

5.3 Cost Efficiency Frontier

Table 5 presents the results of cost efficiency frontier, and the results predict that net-income-to-debt ratio, financing advances-to-deposit ratio has a positive effect on variables like ROA, ROE and Net Profit ratio. According to the Kalban, Y. (2011) [19], the efficiency of Islamic banks was 92.72% around the world. Our studies conducted on Pakistani Islamic banks showed at 98.20% which is relatively higher than the studies done previously. One of the significant factors is that the study is based on 4 full-fledged Islamic Banks and also Pakistan being an Islamic country fosters the environment and demand in the Islamic Banking. Mukhtar et. al., 2006: used SFA to measure the 80% efficiency of Islamic banks in Malaysia while using ROA ratio as the only dependent variable. While our research used ROA, ROE and NP ratios for Islamic banks in Pakistan with the findings of 98.2% efficient for ROA and 92.4% efficient for ROE.

According to the Table 5, the variables like IDR, Musharaka, Mudaraba and Istisna has the negative impact on the profitability, however they effect positively towards the efficiency of the banks. And it is worth mentioning that CAR has acted positively and can result in increased profits, when more equity is injected. In Table 05 the positive coefficient shows increased efficiency with the decreased costs. The ROA and ROE increased 7.6 & 9.6 if net income-total debt increases by 1%. This also represents the decrease in the cost of net income-to-total debt by the same amount. FDR & CAR also behaved positively towards ROA, ROE & NP ratios, whereas negatively towards the cost. ROA increased by 2.6, 9.9 and 21% if the cost of Musharaka, Mudaraba and Istisna are increased by 1%. Also the NP reduced by three hundred and eighty three times, if the Istisna cost increases by 1%. As mentioned EB is the environment of the bank and measured by the number of branches of bank. These variables have negative impact on the profitability of the bank especially for ROA which is recorded 5.1 for every branch added.

6. CONCLUSIONS

Pakistan ranks among the pioneers of the Islamic banking System and the concept is growing with a good pace over the years. Supported by the government initiatives and preferences the Islamic Banking industry has observed strapping thrust with an annual growth rate of more than 30% in recent years.

The Islamic banks in Pakistan are efficient on an average of 88.93% according to ROA at 98.20%, ROE at 91.47% and Net Profits at 77.41%. The empirical analysis shows that ROA in Islamic banks are more efficient as they are based on equity basis. The financial instruments like Musharaka, Mudaraba and Istisna showed more effectiveness in terms of cost in ROA and ROE ratios. As the cost always has direct negative impact on profits, therefore it has delivered unfavorable impact on profit ratios. The growth of Islamic banks has been recorded at 18% annual in Asian countries [Saleh, A. H., Zeitun, R. (2006) [9]] whereas in Pakistan this figure has reached to 30% annual growth (State Bank of Pakistan 2014).

Table 4: Efficiency Measures								
Meezan Bank	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
ROA	0.982151	0.982672	0.980194	0.983573	0.981966	0.983868	0.981465	0.982232
ROE	0.9154	0.9172	0.9063	0.9218	0.9174	0.9206	0.9131	0.9154
NP	0.7726	0.7786	0.75	0.7891	0.7714	0.7922	0.7648	0.7735
Bank Islami	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
ROA	0.981767	0.983032	0.980119	0.98384	0.981244	0.979845	0.98516	0.981227
ROE	0.913	0.9198	0.9057	0.9234	0.9112	0.9058	0.9289	0.911
NP	0.768	0.7831	0.7494	0.7922	0.7624	0.7467	0.8078	0.7622
Al Barka Bank	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
ROA	0.982045	0.982022	0.983098	0.980468	0.982535	0.982275	0.981989	0.982015
ROE	0.9148	0.9149	0.9198	0.9074	0.9172	0.9159	0.9146	0.9147
NP	0.7714	0.7712	0.7837	0.7531	0.7772	0.7741	0.7707	0.7711
Dubai Islamic	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
ROA	0.982278	0.98071	0.983211	0.979837	0.985791	0.979764	0.978334	0.983428
ROE	0.9152	0.9107	0.9167	0.9144	0.927	0.903	0.8996	0.9216
NP	0.774	0.7563	0.7845	0.75	0.8124	0.746	0.7319	0.787

Table 5: Cost Efficiency Frontier			
Variable	**ROA**	**ROE**	**NP**
Constant	178.85***	943.33***	2955.50***
NIDR/Total Debt	7.68***	9.61***	165.13***
IDR	-3.54***	-14.77***	-40.66***
CAR	6.24***	-2.66***	-6.27***
ln Musharaka	-2.68***	-25.73***	-3.29***
ln Mudaraba	-9.95***	-55.33***	-164.20***
ln Istisna	-21.60***	-90.78***	-383.20***
FDR	5.79***	26.36***	77.42***
ln BE	-5.11***	-4.40***	-3.16***
Gamma	0.9457	0.7866	0.8745
*	*10% Level of Significance*		
**	*5% Level of Significance*		
***	*1% Level of Significance*		

The results mentioned above have revealed that Environment of Bank has also negative relationship to the cost efficiency of the bank, as if the environment and facilities of the bank are being improved, it will result in increased costs. They determined of the EB is the number of branches that an Islamic bank has opened. Even though the operating cost will increase, but it will also increase the profitability of the bank. The other variables like FDR, IDR, Musharaka, Mudaraba & Istisna showed negative effect on profitability of the bank, however they were positively efficient. Also the variable CAR also behaved positively as the profits increased when more capital was injected into the operations.

A country with a population of over 180 million people, with a big Muslim majority, the Islamic finance can tackle the faith sensitive voluntary and in involuntary exclusions. This paper reflects a big demand for the participatory modes of Islamic practices by the industry. Thus more branches are required to be operational in the future, which will increase the profitability of the Islamic Banks.

7. ACKNOWLEDGEMENT

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