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Technical Efficiency of Islamic and Commercial Banks: Evidence from Pakistan Using DEA Model (2007-2011)

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Abstract: *This study investigates the technical efficiency of two different banking systems (Islamic vs. Conventional banks) operating in Pakistan and gives a comparative analysis between them over a recent unstudied period, using DEA (Data Envelope Analysis) model. As banking systems render as an important factor towards the economic development of a country. Calculating Technical efficiency can help us determine which banking system is more technically efficient and can facilitate in the economic development and stability of a developing nation such as Pakistan. In this study, a sample of 34 different banks is taken which includes Islamic, conventional and foreign banks working in Pakistan. By taking Investments and Advances as outputs and number of employees, operating fixed asset and deposits as inputs in DEA analysis, the technical efficiencies of the banks are found and compared and then Tobit regression is use to determine the internal and external factor's impact on bank's efficiency.*

Key Words*: Data envelopment analysis, Banking System, Pakistan, Islamic Banking, Technical Efficiency.*

I. Introduction:

The stability and development of an economy is dependent upon the performance of Financial Sector of that country (Zaidi, 2005). Banking System is the vital part of country's financial Sector, and thus for sound economical development, banking sector's performance is crucial. Measuring the efficiencies of banks can give a resourceful insight into banking system and potential of economic development of that country. Thus it is very crucial to highlight the most technically efficient banking system operating in Pakistan. The two distinctive Banking systems that are prevalent in the country are Islamic Banking system that follows the "Shariya" law and the Commercial Banking system based on interest. Commercial banks have been setup in the country since its independence and have very strong and stable operations as compared to Islamic banks. Over the years Commercial banking system has become significantly embedded in government policies and functioning, as governmental monetary policies are implemented thorough commercial banks (Hartman, 2004). Commercial banks have also been used to provide for loans to both government and public sectors, which have helped in country's development and industrialization over time and thus contributing in economic stability. Function of banks is to act as a bridge to provide from surplus unit to deficit unit and paying and taking interest for its services in the economy. As Countries financial systems became overly depended upon the commercial interest based banking system, it aided the Global Financial Crisis (M. Kabir and Kayed, 2011). Interest crisis would have never existed under Islamic banking as it is based on profit-loss sharing. Many researchers and economists like Sarker, 1999; Bashir, 1999; Samad and Hassan, 1999; Hassan and Bashir, 2003; Yudistira, 2003; Hussein, 2004, have found Islamic banking system to be more effective but without empirically testing them. This conflict between the most technically efficient banking systems can be resolve by empirically testing the both banking systems.

Thus the main purpose of this study is to examine the technical efficiencies of commercial banks and Islamic banks in Pakistan as Banking Efficiency is significant for governments as it provides a base for macroeconomic stability (Ngalande, 2003).

Different factors can affect the banks financial performance such as size, profits and interest expense etc (Hussain, 2004). In 1992, Berger and Humphrey found that efficiency variables vary from region to region and by the type of method employed such as parametric, nonparametric and ratios.

In this paper we will by using non parametric DEA analysis and compare them and analyze the factors affecting the technical efficiency of both the banking systems in Pakistan. By taking Investments and Advances as outputs and number of employees, operating fixed asset and deposits as inputs in DEA analysis, the technical efficiencies are determined. Then Tobit regression is use to determine the internal and external factor's impact on bank's efficiency.

II. Literature Review:

The First formal structured banking system formed during Adam Smith era (1776). And in 1800 and 1900 industrial revolution gave birth to the Modern Financial Sector, Merchant Banks, Financial institutions and

other different forms of banking. However Financial System around the world has again undergone some major changes in last 15 years (OECD, 2000). Economists have always found a positive relation among financial growth and economic development of a country (levine et al., 1999; Khan and Senhandji, 2000). Financial Sector has become the backbone of today's economy and banking sector is its integral part (Akhtar, 2002). Technological advancements, Easy information access, intense competition among banks and deregulation in financial markets all led to substantial changes in banking systems. The banking system is now more complex then ever, with significant financial impact on every field of life. The Efficiency of commercial banks and their performance is one of the important factors for the economists around the world because of its contribution in economic growth of the economy (Zaidi, 2005). Banking efficiency acts as catalyst in the economic development of a country (Sathye, 2005). The regulators and economists depend on economic theory to measure the potential of a bank to increase its efficiency, and then compare it with its competitor's performance (Fiorentino and Karmann, 2006).

As banking system act as a Intermediary and liaison between surplus and deficient units, promoting the usage of funds for productive uses and thus helps in building an economy (Freixas and Rochet, 1997). Banking system either Islamic or conventional system, both participates in monetary flow and fulfilling the needs of customer by providing facilities and long term economical benefits (Dar and Presley 2000). Both banking systems differ in their practices mainly because a typical Conventional Banking system is interest based and requires the customers to pay interest while Islamic banking is about profit loss sharing (Kabir and Kayed, 2011). Conventional banking has long spread roots in every field of life. Commercial banking system has become significantly embedded in government policies and functioning, as governmental monetary policies are implemented thorough commercial banks (Hartman, 2004). As Countries financial systems became overly depended upon the commercial interest based banking system, it aided the Global Financial Crisis (Kabir and Kayed, 2011). Interest crisis would have never existed under Islamic banking as it is based on profit-loss sharing as Interest based banking "Riba" is prohibited "Haram" in Islam (Rahim and Rahman, 2007). Thus, Islamic banking is being considered as alternative to interest based banking and gaining more popularity and Islamic Financial products are being introduced in universal banks in developed countries (Yudistira, 2003). The growth of Islamic banking has ever since increased, not only in different nations but also in over all financial sectors (El Gamal, 2006).

However there is very less evidence of any substantial research done to find and measure the technical efficiency of Islamic Banking system as compared to conventional banking system.

Samad and Hassan (1999) used financial ratio analysis to examine the Malaysian Islamic banks performance during 1984-1997. Hassan (2011) compared the risk management practices of the both banking systems. Customer satisfaction level of Islamic Vs Conventional banks in Pakistan was analyzed by Ahmad et al (date).

DEA model, which is a new and more efficient way of finding efficiencies, has been applied by many researchers like Miniaoui and Tchantchane, Musleh-ud-Din (1996), Akhter (2002), Burki and Niazi (2003) and Qayyum and Ahmed (2006) using different set of variables to find efficiency, in Pakistan however there has been a study gap, from period 2007-2011. Thus in study we will be focusing on comparing Technical efficiency of Islamic and conventional banks focusing on Technical Efficiency during 2007 – 2011.

III. Methodology:

3.1 Data Collection and Sampling:

The data collected for the study was obtained from the annual balance sheets, released by State bank of Pakistan from period 2007 to 2011. The data consisted of unbalanced panel data to 34 major banks operating in Pakistan. Out of 34 banks, five were Islamic banks, twenty three conventional banks and six foreign banks operating in Pakistan.

The Efficiency of the banks was measured by DEA analysis and then compared to see which sub sector among performs better. In this study we use DEA model (non parametric) because it forms a frontier by benchmarking the highest efficiency performance of banks and then compare the rest with the benchmark hence giving us a panoramic view of the complete banking sector. After that Tobit model was use to determine the variables influencing the technical efficiency of banks.

3.2 DEA (Data Envelope Analysis):

DEA (Data Envelope Analysis) is a nonparametric, a linear programming model. It does not assume a fixed structural model, thus used in operational research, by determining a benchmark frontier in analysis. Charnes, Cooper and Rhodes (1978), introduced it primarily for assessing the "Productive Efficiency", it is a new and simpler method of measuring and evaluating the performance.

DEA is a multiple input program, taking different types of variables and analyzing them together by benchmarking them on a frontier formed by the most efficient data and then comparing it with the whole, thus it gives a multiple output result. Measurement of inputs and outputs in a DEA model are the result of an

underlying Data Generating Process (DGP). The DEA model assumes an efficiency benchmark of 100% of any firm being evaluated.

3.3 Technical Efficiency:

In 1957, Farell introduced the idea of efficiency of a unit of production, by using the concept of "input oriented measure". It is a linear programming model, which assumes no random mistakes, and is used to measure technical efficiency. Technical efficiency is the measure of effectiveness in which a given set of inputs to produce outputs. A DMU is technically efficient only when is uses minimum level of inputs to produce maximum outputs. Or it may use reduction in input levels while giving up the same amount output.

3.4 Mathematical Formula:

$$Max\ h = \frac{\sum_r u_r y_{rj_0}}{\sum_i v_i x_{ij_0}}$$

$$subject\ to$$

$$\frac{\sum_r u_r y_{rj}}{\sum_i v_i x_{ij}} \le 1, \qquad j = 1, \cdots, n(for\ all\ j)$$

$$u_r, v_i \ge \varepsilon$$

In this equation "x" is input vector and "y" is output vector. The "μ" and "ν" are variables of the given problem and are constrained to be greater than or equal to some small positive quantity "ε" in order to avoid any input or output being ignored in calculating the efficiency. "h" would be the final solution of the model , in this case the Efficiency.

If efficiency or h=1 then this unit is efficient compared to the others. But, if the value is less than l then some other units are more efficient than this unit that determines the most favorable set of weights. This flexibility can be a weakness because the judicious choice of weights by a unit possibly unrelated to the value of any input or output may allow a unit to appear efficient. To solve the model, we need to convert it into linear programming formulation, which is as follows:

This formula shows the DEA model working Under CRS (Constant Return to Scale) which is being applied in this study.

$$Max\ \ h = \sum_r u_r y_{ry_0}$$

$subject\ to$	$dual\ variable$
$\sum_i v_i x_{ij_0} = 100(\%)$	Z_0
$\sum_r u_r y_{rj} - \sum_i v_i x_{ij} \le 0, \quad j = 1, \cdots, n$	λ_j
$-v_i \le -\varepsilon \qquad i = 1, 2, \cdots, m$	s_i^+
$-u_r \le -\varepsilon \qquad r = 1, 2, \cdots, t$	s_r^-

The dual variables "λ′ s" are the shadow prices which is related to the constraints that limits the Efficiency of each unit not to increase than 1. The purpose of binding constraint is that the corresponding unit has an efficiency of 1 and there will be a positive shadow price or dual variable. Hence, positive shadow prices in the primal or positive values for "λ′ s" in the dual correspond to and identify the peer group for any inefficient unit.

Further we will be finding the scale efficiency. If technical efficiency under CRS is equal to technical efficiency under VRS than it means that there is no scale inefficiency, and overall technical inefficiency is due to a pure technical inefficiency.

Therefore;

$$\textbf{Scale Efficiency} = \frac{\textbf{TE under CRS}}{\textbf{TE under VRS}}$$

If the value of scale efficiency is one (1), it means that overall technical inefficiency is due to a pure technical inefficiency. In order to know if banks are operating at IRS or DRS, Coelli (1996) purpose the following the mathematical formula:

$\min_{\theta,\lambda} \theta,$

$st \quad -y_i + Y\lambda \geq 0$

$\theta x_i - X\lambda \geq 0$

$N\lambda \leq 1$

$\lambda \geq 0$

If the result of Technical efficiency under CRS and the technical efficiency under VRS are same, it means that bank is operating at constant return to scale. If both values are not
same then compare the value from VRS with a value $N\lambda$ Technical efficiency if both are unequal then banks are operating at IRS, and if both are equal than bank are operating at DRS (Fare et al., 1985b). Then in 2nd phase Tobit regression Model is applied to find the major micro economics factors influencing the banks efficiency.

3.5 Tobit Model:

James Tobin formed Tobit model in 1958, for purpose of identifying a relation between an independent variable "χ" and a non negative dependent variable "ŷ". The model is applied between two limits; in this research we took values from 0 to 1, as efficiency is measure in percentage and can not be beyond 1 or 100% thus it becomes an ideal model to check the efficiency determinants.

3.6 Variables:

Different researchers took different variables to measure efficiencies of banks in DEA model. Ataullah et al, (2004) took loan and income approach to measure Technical Efficiency. Sathye (2001) used loans and advances as outputs. Advances were also used as output to study the efficiency (Haung and Wang, 2002). And Akhtar (2002) used three variables as outputs which were Advances, loans plus investments. Similarly we use input oriented analysis and take Advances and Investments as outputs and Number of employees, Operating Fixed Assts, Deposits and other Accounts and Administration Expenses as inputs.

Further to analyze which variables are affecting and influencing the technical efficiency scores of banks, we will run Tobit analysis by take assorted qualitative and quantitative variables in this study. For qualitative variable, the ownership structure of the banks is analyzed and for quantitative variables we have selected total Investments of the bank, their advances, natural log of assets have been taken calculate the size of banks, total liabilities, markup revenue earned by bank, the total non markup revenue, markup and non markup expenses of banks. The formula applied is:

Y-it = β0 +β1lnTA it+ β2TLit+β3TMRit+ β4TNMRit+ β+ β5TMEit+ β6TNMEit+ β7TINVESit+ β8TADVit+ βT9NO.EMPLYit + β10D Foreign it+ β11D local it+μit

Where:

Yit= Technical efficiency obtained by i-th bank in time t.
TAit=Total Assets of i-th bank in time t.
TLit= Total liabilities of i-th bank in time t.
TMRit= Total markup Revenue of i-th bank in time t.
TNMRit=Total Non markup revenue of i-th bank in time t.
TMEit= Total markup expenses that i-th bank incurred in time t.
TNMEit=Total non markup expenses that i-th bank incurred in time t.
TINVESit = Total Investment of that i-th bank incurred in time t.
TADVit = Total Advances of that i-th bank incurred in time t.
TNO.EMPLYit = Total Number of Employees of that i-th bank incurred in time t.
D Foreignit=1 if i-th bank in time has foreign ownership otherwise 0.
D localit= 1if i-th bank in time t has local ownership otherwise 0.

IV. Results And Discussion:

As DEA model forms a frontier of all the given data and then high light the best performance. The analysis is done on yearly data thus the estimated efficiency score of the first year of the study (2007), of individual banks would be taken as baseline. The results can be seen in Table 1. The input oriented average

technical efficiency (TE) is 38.1%, pure technical efficiency is 49.2% and scale efficiency is 80.7%, thus we see that overall banking sector in Pakistan, including both Islamic and Conventional systems can improve their efficiency by 20%, without any additional disbursements banking system can decrease their inputs by 20% without effecting their outputs. If we take technical inefficiency we see that it is highest of all, with 62% capability to decrease the inputs giving the same output. Further we can say that scale inefficiency also points out the room available for improvement in the efficiency by decreasing the number of employees in banks.
Further we see that in 2007 only two out of 34 banks were on efficient frontier. Both of these banks are conventional banks, one domestic (ZTBL) and other foreign conventional bank (BTMU). The most scale inefficient banks in 2007 were FWBL and JS bank which are again conventional banking systems. If we consider technical inefficiency, it includes 26 banks which include both Islamic and conventional banks as shown in table 1.

Islamic Banks are scale efficient; however their technical efficiency is at a very low level. As shown in the table Islamic banks such as (Albaraka Bank, Bank Islami, Burj Bank, Dubai Islami Bank) has a scale efficiency of 0.64, 0.70, 0.55 and .99 respectively. But the technical efficiency is as low as 0.189, 0.135, 0.428, 0.41 which connote that technical inefficiency of Islamic banks is because of the scale inefficiency instead of pure technical inefficiency. And implies that that they have a very big room for improvement in their practices and policy implementations and employee recruitments.

Overall the Banking Sector Reveals that in 2007,only 5% of the banks enjoyed economies of scale, and all these banks belong to conventional banking system. 5% are facing diseconomies of scale again these are conventional banking system. Islamic banking system has good scale efficiency however it requires improvement on the part of technical efficiency.

In years preceding, we observed that efficiency of banks much the same, but if we compare it conventional banks efficiency with Islamic banks the scenario is different. Using loan based approach we the result of technical efficiencies of both the systems are given in table 2.1 and table 2.2.

Table 1:

Input Oriented

	Banks	**TE**	**PTE**	**SE**
1	FWBL	0.257	1	0.257
2	NBP	0.204	0.214	0.957
3	BOK	0.539	0.642	0.841
4	BOP	0.221	0.25	0.886
5	ALBARAKA BANK	0.189	0.19	0.999
6	ABPL	0.229	0.246	0.931
7	ACBL	0.251	0.289	0.868
8	BAHL	0.231	0.281	0.824
9	BAF	0.205	0.225	0.91
10	BIPL	0.135	0.209	0.645
11	BURJ BANK	0.428	0.596	0.719
12	DIBPL	0.41	0.735	0.558
13	FBL	0.38	0.39	0.975
14	HBL	0.247	0.251	0.985
15	HMBL	0.643	0.66	0.975
16	JS BANK LIMITED	0.237	0.743	0.319
17	KASB BANK LIMITED	0.272	0.456	0.597
18	MCB BANK LIMITED	0.227	0.244	0.928
19	MEEZAN BANK LIMITED	0.452	0.87	0.52
20	NIB BANK LIMITED	0.224	0.27	0.83
21	SAMBA BANK LIMITED	0.205	0.241	0.852
22	SILKBANK LIMITED	0.753	0.823	0.914
23	SB	0.227	0.323	0.702
24	STANDARD CHARTERED BANK	0.32	0.326	0.983
25	SUMMIT BANK LIMITED	0.492	0.583	0.844
26	UBL	0.247	0.259	0.954
27	IDBP	0.083	0.162	0.516

28	SME BANK LTD.	0.294	0.328	0.895
29	ZTBL	1	1	1
30	CITI BANK	0.839	1	0.839
31	DEUTSCHE BANK AG	0.389	0.555	0.701
32	HSBC BANK	0.335	0.364	0.919
33	OMAN INTERNATIONAL BANK	0.796	1	0.796
34	BTMU	1	1	1
	Mean	**0.381**	**0.492**	**0.807**

Yearly Technical Efficiency under CRS:

Table 2.1

Conventional banks under loan base approach

Year	Technical efficiency		Pure technical efficiency		Scale efficiency	
	Mean	SD	Mean	SD	Mean	SD
2007	.3933	.251	.499	.295	.817	.194
2008	.546	.258	.735	.243	.756	.218
2009	.67	.184	.754	.213	.90	.11
2010	.799	.219	.829	.201	.946	.162
2011	.742	.209	.829	.213	.901	.130

Table 2.2:

Islamic banks under loan base approach

Year	Technical efficiency		Pure technical efficiency		Scale efficiency	
	Mean	SD	Mean	SD	Mean	SD
2007	.290	.150	.432	.275	.730	.190
2008	.297	.150	.332	.192	.864	.148
2009	.364	.240	.372	.242	.975	.014
2010	.652	.235	.658	.233	.99	.013
2011	.359	.266	.401	.295	.909	.061

The table 2.1 and 2.2 show the year vise Input Oriented Technical efficiency score of Conventional local and foreign banks Vs Islamic banks under the CRS approach. The table 2.1 shows that through year 2007- 2009 the technical efficiency of the conventional banks were more than the Islamic banks. In year 2007 the technical efficiency of conventional bank under CRS was .3933 where as the Islamic banks efficiency was .290. In 2008, the conventional banks efficiency was .546 which was still more then Islamic banks which was .297. Year 2009 followed the same trend, the technical efficiency of Conventional banks was .67 and Islamic banks were .364. In 2010 and 2011 the technical efficiency of Conventional banks were .799 and .724 respectively and Islamic banks efficiency was the same. Thus we can conclude that Conventional banks were more technically efficient then Islamic banks from year 2007-2009.

4.1 Determinants of Technical Efficiency under CRS:

The determinants of the technical efficiency have been found by applying Tobit Analysis Model. The table 3 indicates that under CRS at 95% confidence interval, variables like Markup Expense, size of banks, Profit, Ownership, Advancements and number of employees have positive significant relation ship with Technical efficiency. Where as total liabilities and number of employees have significant yet negative relationship with technical efficiency. These results are in accord with findings of Ahmad and Gill (2007a,b) and Shah et al (2012). Non markup revenue and expenses are positively insignificant to technical efficiency. Interest expense has been found to have a significant relation with technical efficiency under CRS approach even in previous studies like Staub et al. (2009). The result of qualitative side, ownership has significantly positive relation with technical efficiency which is also in accord with some previous researches of Isik and

Hassan (2002), and Burki and Niazi (2006). And the results of variables like non markup expense and non markup revenue which are insignificantly related to technical efficiency is also in accord with study of Ahmad and Gill (2007a).

Table 3:

Dependant Variables	TE CRS	Std. Err	t	P>|t|	[95% Conf Interval]	
Markup expense~e	3.52E-08	1.01E-08	3.51	0.001	1.54E-08	5.51E-08
Total liabilities~s	-3.04E-09	8.60E-10	-3.54	0.001	-4.74E-09	-1.34E-09
Ln(total assets)~s	0.0595404	0.026922	2.21	0.028	0.006381	0.112699
Non-Markup revenue ~e	7.81E-09	1.71E-08	0.46	0.649	-2.60E-08	4.16E-08
Non-Markup expense~e	1.80E-08	1.46E-08	1.24	0.219	-1.08E-08	4.67E-08
Profit	4.30E-08	1.12E-08	3.83	0	2.08E-08	6.52E-08
Ownership	0.1308015	0.053359	2.45	0.015	0.025443	0.23616
Investments	9.98E-10	1.12E-09	0.89	0.376	-1.22E-09	3.22E-09
Advances no~d	5.15E-09	2.30E-09	2.24	0.026	6.20E-10	9.69E-09
No of employee	-0.0000346	9.16E-06	-3.78	0	-5.3E-05	-1.7E-05
Constant	-0.4452203	0.45701	-0.97	0.331	-1.3476	0.457162
No of Observations	174	-	-	-	-	-

V. Conclusion:

The purpose of this research was to find out the most technical efficient banking system in Pakistan. As Pakistan is a transitional economy and banking systems being the backbone of economy. Thus it is very important to find which of the two massive banking systems working in the country; Islamic or Conventional banking is more technically efficient and can help in economic stability. The data from year 2007 to 2011 has been taken. And the results present very constructive insights of baking sector performance. The overall banking sector performance has been below average last few years. Scale efficiency has been good however only five banks were technically efficient in 2007. The trend has taken an upward turn, technical efficiency has been seen improving in preceding years, in 2008 eight banks, in 2009 twenty banks, in 2010 twenty seven banks and in 2011 twenty three banks were technically efficient. However if we compare the efficiency of Islamic Vs Conventional banking, results presents a different scenario. The technical efficiency of Islamic banks has been seen lower then that of conventional banks when measured in terms on CRS (constant return to scale). Decomposing the efficiency we found that scale efficiency of both the banking systems were almost identical however the technical efficiency had a huge variance, convenient banking system ranked higher in its efficiency. The main determinants of the technical efficiency has been found out to be variables like Markup expense, Size of bank, Profit, Ownership, Advances which had significantly positive impact on the technical efficiency. On the other side no of employees had a significant negative impact, which points out that bank have over employed.

References:

[1] Ahmad, K. Rehman and N. Safwan, Comparative study of Islamic and conventional banking in Pakistan based on customer satisfaction, African Journal of Business Management, 5(5), (2011), 1768-1773.

[2] Bashir AHM (1999). "Risk and Profitability Measures in Islamic Banks": The Case of Two Sudanese Banks, Islamic Econ. Stud., 6(2): 1-24.

[3] Berger, A.N., Hancock, D. and Humphrey, D.B. (1993a), "Banking efficiency derived frothe profit function",Journal of Banking & Finance,Vol. 17 Nos 2/3, pp. 317-47.

[4] Burki AA, Niazi GSK (2006). Impact of Financial Reforms on Efficiency of State-Owned, Private and Foreign Banks in Pakistan, Center for Management of Economic Research (CMER) Working Paper No. 06-49. Lahore University of Management Sciences, Lahore, Pakistan.

[5] Dar, H. and Presley, J.R. (2000), "Lack of profit loss sharing in Islamic banking: management and control imbalances." International Journal of Islamic Financial Services, Vol. 2, No. 2.

[6] Hartmann, P. (2004) The Impact of Financial Infrastructure Transformation on Monetary

[7] Policy Execution—the Namibian Experience. Keynote Address at the Perago User

[8] Group Conference. BIS Review 53 South Africa.

[9] Hassan and Bashir, 2003," Determinants of Islamic banking profitability, ERF Paper".

[10] Hussain KA (2004). "Banking efficiency in Bahrain: Islamic versus conventional banks", Research Paper, No. 68, IslamicDevelopment Bank, Islamic Research and Training Institute, Jeddah.

[11] Isik I, Hassan MK (2002a). Technical, Scale and Allocative Efficiency of Turkish Banking Industry. J. Bank. Finan., 26: 719-766.

[12] Ngalande, E.E. (April, 2003)," The importance of financial system modernisation in Africa", Keynote Address at the Perago User Group Conference. BIS Review 27 South Africa.

[13] M. Kabir Hassan and Rasem Kayed, 2011 University of New Orleans, US, Arab-American University, Palestine, "The Global Financial Crisis and Islamic Finance" Thunderbird International Business Review.
[14] Samad A, Hassan MK (1999). "The performance of Malaysian Islamic bank during 1984-1997": an exploratory study. Int. J. Islamic Financ. Serv., 1(3): 1-14
[15] Sarker MAA (1999). "Islamic banking in Bangladesh": performance, problems, and prospects, Int. J. Islamic Financ. Serv., 1(3):15-35.
[16] Staub RB, Silva e Souza GD, Tabak BM (2009). Evolution of bank efficiency in Brazil, A DEA approach. Eur. Res. Oper. Res., 30:1-10.
[17] Xavier Freixas and Jean-Charles Rochet (1997) 'Microeconomics of banking' .
[18] W.M. Hassan, Risk Management Practices: A Comparative Analysis between Islamic Banks and Conventional Banks in the Middle East, International Journal of Academic Research, 3, (2011).
[19] Yudistira D (2003). "Efficiency in Islamic banking: an empirical analysis of 18 banks, unpublished pape"r, Department of Economics, Loughborough University, Loughborough.
[20] Zaidi, S.A. (2004), "Issues in Pakistan's economy", Oxford university press, Karachi, Pakistan.

APPENDEX: LIST OF SCHEDULED BANKS INCLUDE IN THE STUDY

	Banks	**Abbreviation**
1	FIRST WOMEN BANK LIMITED	FWBL
2	NATIONAL BANK OF PAKISTAN	NBP
3	THE BANK OF KHYBER	BOK
4	THE BANK OF PUNJAB	BOP
5	ALBARAKA BANK (PAKISTAN) LIMITED	ALBARAKA BANK
6	ALLIED BANK LIMITED	ABPL
7	ASKARI BANK LIMITED	ACBL
8	BANK AL-HABIB LIMITED	BAHL
9	BANK ALFALAH LIMITED	BAF
10	BANKISLAMI PAKISTAN LIMITED	BIPL
11	BURJ BANK LIMITED	BURJ BANK
12	DUBAI ISLAMIC BANK PAKISTAN LIMITED	DIBPL
13	FAYSAL BANK LIMITED	FBL
14	HABIB BANK LIMITED	HBL
15	HABIB METROPOLITAN BANK LIMITED	HMBL
16	JS BANK LIMITED	JS BANK LIMITED
17	KASB BANK LIMITED	KASB BANK LIMITED
18	MCB BANK LIMITED	MCB BANK LIMITED
19	MEEZAN BANK LIMITED	MEEZAN BANK LIMITED
20	NIB BANK LIMITED	NIB BANK LIMITED
21	SAMBA BANK LIMITED	SAMBA BANK LIMITED
22	SILKBANK LIMITED	SILKBANK LIMITED
23	SONERI BANK LIMITED	SB
24	STANDARD CHARTERED BANK (PAKISTAN) LIMITED	STANDARD CHARTERED BANK
25	SUMMIT BANK LIMITED	SUMMIT BANK LIMITED
26	UNITED BANK LIMITED	UBL
27	INDUSTRIAL DEV. BANK OF PAKISTAN	IDBP
28	SME BANK LTD.	SME BANK LTD.
29	ZARAI TARAQIATI BANK LTD	ZTBL
30	BARCLAY's BANK	BARCLAY's BANK
31	CITI BANK N. A.	CITI BANK
32	DEUTSCHE BANK AG	DEUTSCHE BANK AG
33	HSBC BANK MIDDLE EAST LIMITED	HSBC BANK
34	OMAN INTERNATIONAL BANK SAOG	OMAN INTERNATIONAL BANK
35	THE BANK OF TOKYO-MITSUBISHI-UFJ, LIMITED	BTMU

Intermadiation Efficiency Measures Of Commercial And Islamic Banks

		2007			2008			2009			2010			2011		
	Banks	**TE**	**PTE**	**SE**	**TE**	**PTE**	**SE**	**TE**	**PTE**	**SE**	**TE**	**PTE**	**SE**	**TE**	**PTE**	**SE**
1	FWBL	0.257	1	0.257	0.277	0.316	0.877	0.359	0.409	0.877	0.691	0.692	0.999	0.593	0.747	0.793
2	NBP	0.204	0.214	0.957	0.514	1	0.514	0.688	1	0.688	0.841	1	0.841	0.755	1	0.755
3	BOK	0.539	0.642	0.841	0.849	0.864	0.983	0.59	0.611	0.965	0.57	0.571	0.999	0.762	0.785	0.971
4	BOP	0.221	0.25	0.886	0.471	0.951	0.495	0.843	1	0.843	0.954	1	0.954	0.876	1	0.876
5	ALBARAKA BANK	0.189	0.19	0.999	0.083	0.096	0.862	0.088	0.091	0.967	0.595	0.614	0.97	0.194	0.207	0.938
6	ABPL	0.229	0.246	0.931	0.451	0.838	0.538	0.658	0.898	0.732	0.868	1	0.868	0.615	0.913	0.674
7	ACBL	0.251	0.289	0.868	0.37	0.644	0.574	0.592	0.632	0.936	0.767	0.82	0.935	0.752	0.752	0.999
8	BAHL	0.231	0.281	0.824	0.531	0.6	0.885	0.685	0.723	0.946	0.656	0.662	0.992	0.765	1	0.765
9	BAF	0.205	0.225	0.91	0.479	0.703	0.682	0.604	0.686	0.88	0.797	0.89	0.895	0.709	0.751	0.944
10	BIPL	0.135	0.209	0.645	0.253	0.265	0.954	0.279	0.285	0.982	0.533	0.534	0.999	0.146	0.152	0.961
11	BURJ BANK	0.428	0.596	0.719	0.433	0.439	0.987	0.434	0.452	0.96	0.483	0.487	0.991	0.365	0.445	0.82
12	DIBPL	0.41	0.735	0.558	0.348	0.531	0.656	0.655	0.66	0.992	1	1	1	0.734	0.801	0.917
13	FBL	0.38	0.39	0.975	0.665	0.802	0.83	0.839	0.912	0.921	0.851	0.899	0.947	1	1	1
14	HBL	0.247	0.251	0.985	0.505	1	0.505	0.784	1	0.784	0.998	1	0.998	1	1	1
15	HMBL	0.643	0.66	0.975	1	1	1	1	1	1	1	1	1	1	1	1
16	JS BANK LIMITED	0.237	0.743	0.319	0.364	0.369	0.988	0.396	0.405	0.976	0.54	0.541	0.997	0.1	0.108	0.925
17	KASB BANK LIMITED	0.272	0.456	0.597	0.418	0.613	0.682	0.591	0.594	0.995	0.807	0.809	0.997	0.372	0.376	0.987
18	MCB BANK LIMITED	0.227	0.244	0.928	1	1	1	1	1	1	1	1	1	1	1	1
19	MEEZAN BANK LIMITED	0.452	0.87	0.52	0.319	0.449	0.711	0.395	0.431	0.917	0.542	0.549	0.986	0.607	0.61	0.996
20	NIB BANK LIMITED	0.224	0.27	0.83	0.361	0.516	0.699	0.614	0.653	0.941	0.892	0.896	0.995	0.795	0.814	0.977
21	SAMBA BANK LIMITED	0.205	0.241	0.852	0.25	0.258	0.966	0.53	0.54	0.981	0.724	0.727	0.996	0.77	0.879	0.876
22	SILKBANK LIMITED	0.753	0.823	0.914	0.434	0.548	0.792	0.55	0.552	0.995	1	1	1	0.68	0.682	0.998
23	SB	0.227	0.323	0.702	0.471	0.658	0.716	0.646	0.665	0.972	0.83	0.83	1	0.766	0.782	0.98
24	STANDARD CHARTERED BANK	0.32	0.326	0.983	0.387	0.803	0.482	0.673	0.722	0.931	0.989	1	0.989	0.793	0.796	0.996
25	SUMMIT BANK LIMITED	0.492	0.583	0.844	0.575	0.694	0.83	0.637	0.641	0.995	0.911	0.911	1	0.749	0.751	0.998
26	UBL	0.247	0.259	0.954	0.47	1	0.47	0.751	1	0.751	0.846	0.911	0.929	0.69	0.99	0.696
27	IDBP	0.083	0.162	0.516	1	1	1	0.646	0.804	0.803	0.026	0.256	0.102	0.672	1	0.672
28	SME BANK LTD.	0.294	0.328	0.895	0.31	0.418	0.741	0.497	0.528	0.942	0.613	0.659	0.931	0.425	0.806	0.527
29	ZTBL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	BARCLAY's BANK	-	-	-	0.355	0.364	0.976	0.489	0.491	0.995	0.561	0.561	0.999	0.6	0.637	0.941
31	CITI BANK	0.839	1	0.839	0.574	0.696	0.825	0.5	0.567	0.881	0.521	0.521	1	0.505	0.532	0.948
32	DEUTSCHE BANK AG	0.389	0.555	0.701	1	1	1	0.919	0.934	0.984	1	1	1	1	1	1
33	HSBC BANK	0.335	0.364	0.919	0.352	0.701	0.502	0.79	1	0.79	1	1	1	1	1	1
34	OMAN INTERNATIONAL BANK	0.796	1	0.796	0.186	1	0.186	0.504	1	0.504	1	1	1	0.738	1	0.738
35	BTMU	1	1	1	1	1	1	1	1	1	1	1	1	0.927	1	0.927