Measuring efficiency Analysis: Islamic VS Commercial bank in Pakistan[12]

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Abstract

This paper seeks to analyze efficiency of Islamic banking sector with conventional banking sector in Pakistan. For this purpose to represent Islamic banking sector, Meezan Bank Limited is selected, as the bank operates on the basis of Islamic banking system. While for conventional banking sector Habib Bank Limited is selected. To compare the performance and efficiency certain inputs and outputs have been selected. Assets, Employees and Branches have been taken as inputs while outputs are deposits held by these banks and profit after tax. Data Envelopment Analysis technique is used using TORA operation research software to analyze and interpret results. Conclusively it is noted that both banks are performing efficient with regard to available resources. Hence an increase in inputs will have positive impact on the outputs.

Key Words: Banking efficiency, Data envelopment analysis, Islamic banking system, conventional banking system.

1. Introduction:

Financial markets make significant impact towards economic and social growth of a country. These include banks, stock exchanges, credit unions and money lending institutions. "As per the State Bank of Pakistan's report of 2010, financial markets of Pakistan is growing at an average of 13.86% per year with the banking sector being the biggest player with asset composition of 73.2% (State Bank of Pakistan, 2010). As per the same report in the year 2010 it grew by 9.2 trillion rupees.

Being an integral part of the financial sector, these institutions plays their important role by utilizing savings and stimulating investments. Efficient operations of these institutions helps in increasing investments, productivity thus helping raising the real sector. As blood is a must for body, similarly established banking sector is for economy. Its efficiency in performance is

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subject to many researches and studies for evaluating its role in social wellbeing which has shown a positive relationship between financial sector growth and economic growth (Zaidi, 2005).

In Pakistan – and gradually rest of the world – there are two types of banking system in operation Conventional and Islamic banking system. Conventional banking system have been present since the independence of the Pakistan, while Islamic banking system have been introduced since 80s. Islamic banking systems have been growing with noticeable rate of 15% annually. Being a country based on Islamic concepts, interest is ignoring in Islamic banking system. Keeping with the demand conventional banks have also started offering products based on Islamic principles. With the reference of Sharia, Islamic banking system is based on the following important framework.

1. No interest.
2. Strong restriction of speculation.
3. Compulsory deduction of Zakat on Islamic principles.
4. No dealing of goods and services that are illegal as per the country and sharia law.

The industry developed around Islamic banking system has been growing with services of profiting from investment, customer services and trading. The introduction of Islamic banking offering desks in conventional banking systems have created a competition that has been increasing from time to time. Many conventional banks have also introduced separate branches that offer Islamic banking services. However, this competition had made it possible that both such type of banking systems has become efficient. However, the share in the market, in the long term, and profitability of both sectors depend on seeking efficiency in sectors such as technical, scale and pure efficiency respectively.

It is also noted that through introduction innovative technologies and getting advantages from modern technological developments, banking systems have become more competitive. Thus to survive in fierce competition it is important to be efficient in the industry. Being comparatively new to the conventional banking system, Islamic banking system is risky however payoff from successful practices is also tremendous. This is because that conventional banking industry is very large, popular, with strong history and expertise with interest as main driver of the sector (Saeed, Ali, Adeeb and Hamid 2013) and (Aziz, Husin & Hashmi, 2016)

Above in view, various research studies have been carried out in other countries targeting efficiency of banking sector especially in Malaysia and Bahrain as well as impact of banks on social and economic life of a

country. However, there is limited literature when it comes to studying Pakistani banking scenario with regard to efficient performance. Similarly it is also required that both commercial and Islamic banks including both consumer and investment banks need to be studied to develop literature and identify drawbacks for improvement". Because of this gap, research is needed to target the efficiency of both Islamic and conventional banking systems in Pakistan.

The purpose of this research study is to compare the performance of conventional and Islamic banking sectors in Pakistan. For this purpose Data Envelopment Analysis (DEA) is used to check for the efficiency of both sectors. Habib Bank Limited (HBL) has been selected from conventional banking sector while Meezan Bank Limited (MBL) has been selected from Islamic banking sector. HBL is being the first and one of the largest commercial bank of the country with its international operations starting in 1951 in Colombo, Sri Lanka. While MBL is being the largest Islamic bank in Pakistan operating since 2002 with first ever Islamic commercial banking license issued by State Bank of Pakistan.

2. Literature Review

The study of efficiency of banking sector has grown up since 1990s and many studies have been pointed towards that angle. "Researchers, managers, policy makers and other stakeholders have significantly studied performance of banking systems after soaring competition between banks to develop framework and criteria for evaluation of banking sector. The emergence of Islamic banking sector has considerably increased such studies and discussion in comparison to conventional banking sectors.

Iqbal (2001) studied both Islamic and Conventional banking system through comparative analysis using trend and ratios. The result was that in the period of 1990-98 Islamic banking sector performed fairly well as compared to conventional banking performance. However trend analysis showed a downward performance subject to the operations being conducted by conventional banks and Islamic banks being in its introductory stages.

Revenue maximization efficiency of private sector, public sector and foreign banks in India were compared by Mohan and Ray (2004) for the periods of 1990s. For the purpose deposits and operating costs were taken as input while loans, other income and investment were taken as output. The study concluded that public sector banks performed better than private banks on maximization of revenue efficiency.

Similar techniques of DEA were applied by Grigorian and Manole (2005) to compare both the sectors for the periods of 2000-05 to measure the efficiency of both sectors. The results showed that Islamic banks

performed well then conventional banks despite the size and expertise of conventional banking system.

Bader, Mohammad, Ariff and Hassan (2008) found that cost efficiency of Islamic banking system is lower however profit and revenue efficiency is higher in Islamic banks then conventional banks with DEA efficiency measure. The study was based on cross-country comparison of both sectors.

Hamid and Azmi (2011) investigated the comparison of both sectors using interest free and interests based banking system for the periods 2000-09. The result obtained through ratio analysis and t-test indicated that Islamic banks were less risky and more liquid as compared to interest based conventional banking system.

Similarly Sufian and Noor (2009) studied Islamic banking systems by comparison of MENA and Asian Islamic banks. The study carried out in a way to target technical, pure and scale efficiency of these banking systems. The study identified that MENA has been more efficient as compared to its Asian counterparts. The study used Data Envelopment Analysis techniques to study efficiency at the selected banks. And concluded that managerial skills needed to be developed in Islamic banking systems.

Safiullah (2010) conducted a study to analyze interest based and interest free performance of Islamic and conventional banking systems. The study noted that there is efficiency in both sectors but at different levels. The study noted that conventional banks are efficient when it comes to the terms of liquidity as compared to Islamic banking systems. However, Islamic banks are more efficient in terms of profitability, liquidity and solvency. The study final conclusions, through various ratio tests, proved that Islamic banks were more efficient over all. Similarly opening of windows offering Islamic bank facilities inside conventional banks is also considered superior performance indicator of Islamic banking system. The study also suggested that conventional banks may take expansion strategies to cover rural areas of the country Pakistan to enhance banking and economic sectors of the country.

In Malaysia, Islamic banking sector efficiency was measured by Zainal and Ismail (2012) for the periods between 2006-10 with results that both domestic and foreign Islamic banking sector achieved higher technical and scale efficiencies.

With help of Data Envelopment Analysis, Sillah and Harrathi (2015) studied efficiency of both Islamic and conventional banking sectors in Gulf Cooperation Council (GCC) for the periods of 2006-12. The output variables used for the study were loans and investments while input

variables were equity, assets, general expenses and total deposits of the sectors". The result differentiated based on countries. In Saudia Arabia, Qatar and Kuwait the efficiency of both sectors was same, however in Bahrain and UAE conventional banking system performed more efficiently.

3. Methodology

Methodology is discussed in the following paragraphs;

3.1 Data Envelopment Analysis (DEA) Approach

The first identified such approach of application of DEA for efficiency checking was in Agricultural sector. "In 1950 Farrell applied the technique throughout the USA involving 48 states of the country. For the application of the procedure of DEA first inputs and outputs were defined. However the term DEA was not in use. For the first time the term DEA was applied in education sector particularly for analyzing Program Follow Through in USA in late seventies (Rhodes 1978). From that time the technique of DEA has been in use to compare and identify various peer units for performance in available inputs and outputs. DEA technique has been widely used in major sectors such as health (Wilson et al. 2012), for checking of performance of county goals and its operations in various areas of a country (Seiford and Zhu 2002), for evaluation of performance of judicial systems such as courts and police stations (Schneider 2005), for evaluation of performance of education sector such as universities, schools and colleges (Bougnol et al. 2010) and other many as such sectors.

Lately the technique is widely known for efficiency checking and has been used in other growing sectors such as evaluation of transit systems (Chiu et al. 2011), evaluation of performance of mining units with regard to output (Chen et al. 2010), air transportation systems (Pestana eDieke2007) and even for evaluation of banking sector with regards to input and output systems (Emrouznejad and Anouze 2010).

The process of DEA makes it simple by identifying inputs and outputs in a defined context followed by evaluating performance of various units with regard to similar inputs and outputs. In the process a model unit is compared with peer groups where poorly performing peer units are identified followed by various factors that needs to be examined to improve the performance (Charnes, Cooper and Rhodes, 1978).

Furthermore, DEA was used to check efficiency of nonprofit organizations such as public sector departments. However to evaluate the efficiency of banking sector, it was first applied by Sherman and Gold (1985). Since then the technique has been expansively used to evaluate efficiency of organizations.

DEA technique has certain benefits and drawback attached to it. In its benefits includes its ability to accommodate for inputs and outputs multiplicity. DEA considers returns to scales while calculating efficiency depending on the size and output levels of organizations. However like with other models, modification of inputs and outputs factors effects the results (Berg, 2010).

Out of the many techniques, DEA makes it easy to identify underperforming units and departments provided that comparison takes place with regard to a particular context. Similarly DEA also helps in providing information with regard to peer group and provides levels of substandard performance. Through the process first a model unit is identified, with which peer units are compared for identification of efficiency. Following this success factors are identified which are required to be followed to improve performance. Thanassoulis (1993) notes that out of the available techniques such as regression analysis, DEA is more suitable because this technique also considers the contexts and peer groups performance.

The technique of DEA considers the efficiency in comparative basis by evaluating inputs and outputs of the multiple organization on the same functions and operations. For this purpose to compare Islamic banking system and Conventional banking system HBL and MBL are selected to be compared. MBL has been selected as an Islamic bank while HBL has been selected as conventional bank. Different steps of DEA method are discussed below;

3.2 Objective Function of the model

There are two approaches used to evaluate the efficiency levels. First an input oriented approach is used with at least one given output to know possibilities of minimizing input with maximum output results. Second an output oriented approach is used to know the possibilities of maximization with given inputs (Cooper, Seiford and Tone 2006)

Although both these approaches results in checking of efficiency, however result obtained is not the same for inefficient performance (Seelanatha, 2007). For the current an input oriented approach is used called BCC Model, developed by Banker, Charnes and Cooper. The model emphasis on

minimizing inputs to achieve maximum output. Therefore inefficiency is denoted by E making the objective function as:

Min **E**

3.3 Measurement of relative efficiency:

The simplest way to measure efficiency is:

Efficiency =Input /Output

In case of single input and output, the model is simple and easy. However this approach is not enough when there are more than one inputs and outputs. For multiple inputs and outputs Farrell (1957) introduced measurement of relative efficiency.

Using this approach, linear programming technique is applied by developing a hypothetical composite constraints and assigning of weights (g) to each department equaling to 1. The composite constraint depends on the decision variables of the function. Thus the first linear constraint will be:

$$g1 + g2 + g3 + g4 \ldots gn = 1$$

As long as the inputs and outputs are similar, these can be used to compare performance. A linear programming model is used for each department separately. DEA model is to determine whether a hypothetical composite facility can achieve the same or more output while requiring less input.

If less output with more input can be achieved, the facility being evaluated is judged to be relatively inefficient.

3.4 Specification of Inputs and Outputs Variables:

It is always been a challenge and controversial issue in the researchers on the choice of selection of inputs and outputs factors. However, based on the availability of data and available literature, inputs and outputs are chosen with the trend of practice. There are two types of tactics that are normally used to measure the efficiency of banking sector: production approach and intermediation approach. Prior considers banks being as firms with utilization of capital and labor and production in the form of deposits and loans in its different forms (Colwell and Davis, 1992). The later, intermediation approach, however, involves role of banks as intermediation in funds transfer between depositors and borrowers (Fortin and Leclerc, 2007). The later approach is suitable in case of Islamic banking system, as the system is involved in profit sharing contracts and equity participation with depositors (Majid, Saal and Battisti, 2009).

For the application of DEA, it is important to use same standards and factors of comparison i-e similar inputs and outputs for both Meezan Bank Limited and Habib Bank Limited. This approach has been used

previously in similar studies (Drake and Hall (2003), Kamaruddin, Safa, and Mohd (2008)**.**

3.5 Selection of Inputs and Outputs:

There has been mixed evidence whether the size of the bank has impact on its performance efficiency. Gas and Ghosh (2009), Drake, Hall, and Simper (2006), and Yudistira (2003) suggests through their works that size has positive impact on the efficiency of banks performance.

However others, such as Bdour and Al-khoury (2008), Danesh (2007) and Sufian (2007) indicated that size does not have a maintained impact on efficiency because of mergers, acquisitions, and network expansions of such banks".

For this study the following inputs and outputs are selected for the study for the year 2016.

Input 1: Total Assets (in billions USD).

Input 2: Number of branches operating within Pakistan.

Input 3: Number of employees working in Pakistan.

Output 1: Total Deposits (in billions USD).

Output 2: Profit After Tax (in billions USD).

Let X1 is HBL and X2 is MBL.

Mathematical form of data:

The mathematical form of the problem is given below:

Objective Function:

Objective is to minimize and efficiently use of the selected inputs so that the banks get maximum profit.

i.e. Min E

Composite Constraints for HBL and MBL:

$WX1 + WX2 = 1$

I. Constraints for Outputs Measures of HBL:

a. Profit after Tax:

$0.327WX1 + 0.5562WX2 \geq 0.327$

b. Deposit:

$18.03WX1 + 5.64WX2 \geq 18.03$

II. Constraints for Input Measures of HBL:

a. Assets:

$23.96WX1 + 6.57WX2 \leq 23.96E$

b. Branches:

$1700WX1 + 551WX2 \leq 1700E$

c. Employees:

$15000WX1 + 9300WX2 \leq 15000E$

I. Constraints for Outputs Measures of MBL:

b. Profit after Tax:

$0.327WX1 + 0.5562WX2 \geq 0.5562$

b. Deposit:

$18.03WX1 + 5.64WX2 \geq 5.64$

II. Constraints for Input Measures of MBL:

b. Assets:

$23.96WX1 + 6.57WX2 \leq 6.57E$

b. Branches:

$1700WX1 + 551WX2 \leq 551E$

c. Employees:

$15000WX1 + 9300WX2 \leq 9300E$

The above equation were entered in the TORA software to find out that the selected Bank is efficient or otherwise.

If the value of E in TORA software is 01, it means that the selected bank is efficient or otherwise.

4. DEA Results and Interpretations

By the application of TORA, an Operation Research software linear programming were used to solve this DEA model. By inputting the data and application of relevant tools in TORA software, the following results were obtained.

Table 1: Tora Software Results of HBL and MBL BANKS

	HBL	**MBL**	**Slack - / Surplus + for both banks**
Objective value (Min)	**1.00**	**1.00**	-
Constraints	-	-	-
Profit after Tax	0.327	0.5562	0
Deposit	18.03	5.64	0
Assets	23.96	6.57	0
Branches	1700	551	0
Employees	15000	9300	0

All computation were performed by using the method of DEA. The efficiency of Habib Bank Limited as conventional and Meezan Bank Limited as Islamic was examined by applying DEA approach with the given unique inputs and outputs. The data i.e. all inputs and outputs put into the TORA software and both banks in the study were measured separately. The result that was obtained are given in table 1, above indicates that the objective value (Min) is obtained one for both banks during the study which confirmed that both the banks are performing efficiently with regard to their

available resources. In other words both banks are performing at optimum utilization of available resources.

5. Conclusion

The present study is used to investigate the efficiency of conventional and Islamic bank operating in Pakistan. Using a non-parametric technique that is Data Envelopment Analysis with the selected unique inputs and outputs. By the available inputs of assets, branches and employees it is noted that the banks have achieved the maximum output of profit and deposits which is indicated in the zero values of slacks and surpluses in the result table no. 1. As both banks have access to the modern and efficient technology. By using all efforts by both banks, it is concluded that both banks were found efficient during the study. Further, it is recommended that more efforts should be made i.e. to increase the inputs for more positive outputs for both banks.

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