Cost, Revenue, and Profit Efficiency of Conventional versus Islamic Banks: Evidence from the Middle East

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ABSTRACT

Despite the substantial evidence on the efficiency of financial institutions, there is no comprehensive evidence documented on the cost, revenue, and profit efficiency of Islamic and conventional banks in the Middle East region. This paper presents evidence on cost, revenue, and profit efficiency of 22 Islamic versus 18 conventional banks selected from 12 Islamic countries in the Middle East using the Data Envelopment Analysis. The findings suggest that there is substantial avenue for reducing costs and increasing revenue and profits in both banking systems. On average, size and age difference does contribute towards the differences in efficiency between both banking streams. However, conventional banks are, slightly, more cost efficient while the Islamic banks are, slightly, more revenue and profit efficient, a finding that indicates the profitability of this new form of banking.

Key words: Conventional Banks, Islamic Banks, Cost Efficiency, Revenue Efficiency, Profit Efficiency, Data Envelopment Analysis (DEA).

1. Introduction

In the current globalised and fast changing world, banks are under great pressure to perform well all the time, and are forced by competitors and regulators to continue monitor their performance (Rose and Hudgins, 2005). It is critical for depositors, investors, regulators and the public at large to have special interest in the performance of banking institutions (Ayadi, 1998). In a competitive environment, one way to stay at the helm of the herd is to minimize costs and maximize revenue and profits, which can be achieved through improvements in costs, revenue and profit efficiency. Therefore, the issue of whether Islamic banks are more efficient and outperform conventional banks is an important issue that concerns all stakeholders.

In this regard, there has been an increasing interest in academic research on issues relating to Islamic financial services and more specifically the the Islamic banking services. This is, perhaps due to the rapid growth of Islamic banking industry as these institutions have grown worldwide at a remarkable pace during the last three decades. According to a study by the International Monetary Fund[1], the number of institutions rose from 75 in 1975 to over 300 in 2005, in more than 75 countries. Total assets are estimated to be USD 250 billion, which is growing at about 15 percent per year, three times the rate for conventional banks. However, the size of Islamic banking assets of USD 250-300 billion should be considered in perspective. The three top conventional banking groups in 2005 had large assets: UBS of Switzerland (USD 1,533 billion); Citigroup of the USA (USD 1,484 billion); and Mizuho Financial Group of Japan (USD 1,296 billion). Bank of America, ranked as the tenth, has assets of USD 1,110 billion, which is 4 times greater than the assets of all Islamic financial institutions.

The conventional banking theories assume that banks earn profits by purchasing transactions deposits from the former set of agents at a low interest rate, then reselling those funds to the latter set of agents at a higher interest rate, based on its competitive advantage at gathering information and underwriting risk (Santos, 2000). In other words, conventional banks make profits from the spread between the interest rate received from borrowers and the interest rate paid to depositors.

Islamic banking performs the same intermediary function but does not receive a pre-determined interest from borrowers and does not pay a predetermined interest to the depositors: the amount of profits is based on the profit share agreements with the depositors and also with the borrowers. Similar to the conventional banks, there are fee-based banking services that are similar to the Islamic banks as long as there is no pre-determined interest payment/receipt in the transaction. Thus, Islamic banking is considered as a *different* banking stream as it excludes interest and replaces with (a) profit share and (b) the profit share depends on the extent of the risk participation of the parties. The absence of pre-determined rewards is based on Qu*ranic* commands and as interpreted using *Shari'ah* principles[2].

[1] See International Monetary Fund, "Islamic Finance Gears up," *Finance and Development*, Vol. 42 No. 4, December 2005.
[2] For a simple description of the two banking streams, see Ariff (2006).

In this perspective, even though both conventional and Islamic banks work on different principles, they have a similar objective to minimise costs and maximise revenues and profits to survive. As such, continuous evaluation of overall performance in general and cost, revenue, and profit efficiency in particular is essential for survival of banks in the competitive banking industry.

Conventional banks enjoy several advantages over Islamic banks. For example, conventional banks have very long history and experience, accept interest which is a major source of bank revenues, do not share loss with clients and ask for guaranteed collaterals in most transactions, enjoy very huge capital, spread very widely, have much more developed technologies, proved to benefit from sophisticated theoretical and empirical research, and are allowed to provide Islamic banking services (*e.g.* Citibank, Bank of America, Deutche Bank, ABN, AMRO, USB, HSBC, and ANZ Grindlays). In light of the above advantages, it is interesting to examine efficiency of conventional banks vis-vis the Islamic banks.

Unlike the conventional banks, not much is known about the cost, revenue, and profit efficiency of Islamic banks across the world. Some scatchy evidence (*e.g.* Hassan and Bashir, 2003; Sarker, 1999; Bashir, 1999; Samad and Hassan, 1999; Yudistira, 2003; and Hussien, 2004) documented is inconclusive. This paper provides some evidence on the efficiency of Islamic banks versus their conventional counterparts across 12 Mid-Eastern countries.

To further substantiate evidence on this inconclusive issue, this study uses a new set of international data from the Middle East and compares the cost, revenue, and profit efficiency of Islamic banks and conventional banks of different age and size over the period 1990-2005**.**

2. Literature Review

The most well-known approaches to explain banking function process are the production and intermediation approaches. In the *production approach***,** banking activities are described as the production of services to depositors and borrowers. Traditional production factors, land, labour and capital, are used as inputs to produce desired outputs. The production approach views banks as producers of loan and deposit services using capital and labour. The number of accounts of each type is the appropriate definition of outputs. The total costs under this approach are exclusive of interest expense, thus considering only operating but not interest costs and outputs are measured by the number of accounts serviced as opposed to dollar values (Iqbal and Molyneux, 2005). However, majority of the recent empirical research of banking efficiency are based on the intermediation approach.

The intermediation approach was suggested by Sealey and Lindley (1977), in fact it is complementary to the production approach. It views bank as an intermediator of financial services and assumes that banks collect funds (deposits and purchased funds with the assistance of labour and capital) and transform these into loans and other assets. The deposits are treated as inputs along with capital and labour and the volumes of earning assets are defined as measures of output. The intermediation approach may be more appropriate for evaluating entire financial institutions because this approach is inclusive of interest and/or funding expenses, which often

account for between one-half and two-thirds of total costs. Moreover, the intermediation approach may be superior for evaluating the importance of frontier efficiency for the profitability of financial institutions, since the minimisation of total costs, and not just production costs, is needed to maximise profits (Iqbal and Molyneux, 2005).

Whereas Islamic banking literature mostly represents studies from emerging markets and less developed countries, conventional banking literature includes studies from both developed and less developed countries. However, few studies cover the whole international banking industry perhaps due to the scope of studies and research difficulties and limitations that are associated with comprehensive studies.

Existing empirical studies in this area are classified into two groups. The first group includes studies that assess the performance of Islamic banks using traditional financial ratios (*e.g*. Samad, 1999; Bashir, 1999; Hassan and Bashir, 2003; Beccalli *et al*., 2006; Bader and Shamsher, 2006). Some of those studies compared their results with conventional banks. The second group of studies focus on banks' efficiency and utilise frontier analysis approach rather than traditional financial ratios. The studies in this group can be divided into three folds: i) studies that evaluate efficiency of Islamic banks (*e.g.* Yudistira, 2003; Brown and Skully 2005; Hassan, 2005; and Bader, Ariff, and Taufiq, 2007), ii) studies that assess conventional banks' efficiency (*e.g.* Berger *et al*., 1997; Weill, 2004; Bos and Kool, 2005; and Bader, 2007), and iii) studies that compare the efficiency of Islamic with conventional banks (*e.g.* Al-jarrah and Molyneux, 2003, Al-Shammari, 2003; Hussein, 2004; and Bader, Ariff, and Shamsher, 2007).

Iqbal and Molyneux (2005) find that frontier approaches are considered to be superior to standard financial ratio analysis, as it permits the researcher to focus on quantified measures of costs, inputs, outputs, revenues, profits, *etc*. to impute efficiency relative to the best practice institutions in the population. This provides more accurate estimates of the underlying performance of firms and their managers.

Al-Jarrah and Molyneux (2003) investigate the efficiency of the banking system in Jordan, Egypt, Saudi Arabia and Bahrain. Their sample comprises 82 banks over the period 1992-2000. They use the (SFA) and Fourier-Flexible (FF) form, based on intermediation approach to estimate cost and profit efficiency levels in the countries under investigation. Their results show that larger banks seem to be more profit efficient. In their analysis, Bahrain had the most cost efficient banks while Jordan had the least cost efficient banks. On average, the profit efficiency of Arabic banking system has not witnessed significant changes over 1993-1999 and has experienced a decline in profit efficiency in 2000.

Hussein (2004) examined the performance of banks in Bahrain as a leading financial centre in the Gulf region. He estimated how close Bahrain banks are from their potential profits that a best-practice bank can earn and compare the profit efficiency of Islamic versus conventional banks. Using the Fourier's Flexible functional model to estimate the profit efficiency index, he reported that the profit efficiency of Bahrain banks over 1985-2001 is relatively stable and in line with the Organisation for Economic Co-operation and Development (OECD) banks. In general, there is not much difference in profit efficiency between Islamic and conventional investment

banks, despite the fact that many Islamic banks are small and act as venture capitalist. In contrast, the only Islamic commercial bank outperformed the conventional counterparts, probably due to lack of competition and therefore the Islamic commercial banks are able to reduce inputs' costs and charge higher mark-up.

3. Data and Methodology

3.1 Data and Sample Selection

The paper evaluates a cross-country level data compiled from the financial statements of 40 banks in 12 of Organisation of Islamic Conference (OIC) countries in the Middle East as follows: 18 conventional banks, and 22 Islamic banks. The countries included in the sample are: Egypt, Bahrain, Iran, Jordan, Kuwait, Lebanon, Qatar, Saudi Arabia, Turkey, UAE, and Yemen.

Data analysis in this study is based on average results to compare between conventional and Islamic banks groups. First, the study examines overall average results for conventional, Islamic, and all banks. Then the sample is re-classified into groups based on their size as measured by their total assets and their age as measured by the date of establishment respectively.

The data was collected from the BankScope database over the period 1990-2005[3]. The choice of this sample period reflects two factors: First, to cover the longest available history of Islamic banks. In this regard, investigating of long period of years helps to distinguish reliability between random noise and bank inefficiency in the errors of estimated cost functions (Fries and Taci, 2005). Second, the use of a relatively long observation period provides us with estimates that are more representative of the present situation and of future trends. A disadvantage in this efficiency estimates; however, is that random fluctuations play a more important role. Over a long time period, however, any good or bad "luck" should not be the main driver of the efficiency estimates (Rime and Stiroh, 2003).

For each bank in each country in the sample and for *each year* available over the period 1990-2005, the following information was collected to select the group of banks and to run the proposed analysis: (i) the financial statements and annual reports; (ii) total assets (size); (iii) date of establishment (age); and (iv) inflation rates.

The primary source for data used in this research is the banks' balance sheets and income statements in the *BankScope* database produced by the Bureau van Dijk, which includes data on 25,800 banks world-wide. This database is updated monthly and the latest issue of the *BankScope* database, at the time of data collection, is used in this study. *BankScope* reports the data in the original currencies of the respected countries and provide a choice to covert the data to any other currency including the USD. This study uses the USD-based reports in the selected sample. Accordingly, all figures have been adjusted for inflation rates in the respective countries.

[3] Not all bank shave 16-years history, especially the new banks category.

3.2 Objectives

The main objectives of this paper are to observe whether:

1. The mean cost, revenue and profit efficiency of conventional banks is significantly better than those of Islamic Banks.
2. The mean cost, revenue and profit efficiency of big banks are significantly better than those of small banks.
3. The mean cost, revenue and profit efficiency of big conventional banks is significantly better than those of big Islamic Banks.
4. The mean cost, revenue and profit efficiency of small conventional banks is significantly better than those of small Islamic Banks.
5. The mean cost, revenue and profit efficiency of old banks are significantly better than those of new banks.
6. The mean cost, revenue and profit efficiency of old conventional banks is significantly better than those of old Islamic Banks.
7. The mean cost, revenue and profit efficiency of new conventional banks is significantly better than those of new Islamic Banks.

3.3 Data Envelopment Analysis (DEA)

Farrell (1957) originally developed this non-parametric efficiency approach. The DEA is non-parametric in the sense that it simply constructs the frontier of the observed input-output ratios by linear programming techniques (Iqbal and Molyneux (2005). For an introduction to DEA methodology, see for instance Coelli *et al.* (1998) and Thanassoulis (2001).

The DEA initially developed by Charnes *et al*. (1978) to evaluate the efficiency of public sector non-profit organisations. However, Sherman and Gold (1985) were the first to apply DEA to banking. The DEA technique is extensively used in many recent banking efficiency studies like (Halkos and Salamouris, 2004; Wu *et al*., 2005; Havrylchyk, 2006; Drake *et al*., 2006; and others).The advantage of the DEA approach is that no functional or distributional forms need to be specified; however, all deviations from the frontier are attributed to inefficiency, since no allowance for noise is made (Thanassoulis, 2001).

Technical efficiency reflects the ability of a firm to obtain maximum output from a given set of inputs (Farrell, 1957). There is an increasing concern in measuring and comparing efficiency of firms under different environments and activities. One of the simplest and easiest ways to measure efficiency is:

$$\text{Efficiency} = \frac{output}{input} \qquad (1)$$

If a firm produces only one output, using one input this could be done easily. However, this method is often inadequate as firms normally produce multiple outputs by using various inputs related to different resources.

The measurement of relative efficiency which involves multiple, possibly incommensurate inputs and outputs was first addressed by Farrell (1957). The aim of this technique is to define a frontier of most efficient decision making units (DMUs)

and then to measure how far from the frontiers are the less efficient units. The relative efficiency can be measured as:

$$\text{Efficiency} = \frac{\textit{weighted sum of outputs}}{\textit{weighted sum of inputs}} \qquad (2)$$

By using usual notations, this efficiency measure can be written as:

$$\text{Efficiency of unit j} = \frac{u_1 y_{1j} + u_2 y_{2j} + \ldots}{v_1 x_{1j} + v_2 x_{2j} + \ldots} \qquad (3)$$

where:

u_1 is the weight given to output 1

y_{1j} is the amount of output 1 from unit j

v_1 is the weight given to input 1

x_{1j} is the amount of input 1 to unit j

This measure of efficiency assumes a common set of weights to be applied across all units. This raises the problem of how much an agreed common set of weights can be applied to all units. In cases where there is only one input and one output, often efficiency is measured as an output-input ratio. But, a typical DMU will have multiple inputs and outputs. Efficiency can be measured by using a weighted average of the outputs and a weighted average of inputs. When comparing efficiency between DMUs, the above measure can be most readily applied when a common set of weights for the DMUs is applicable.

Charnes *et al.* (1978) recognised the difficulty in seeking a common weight to determine the relative efficiency. They recognised the importance that different units might value inputs and outputs differently, so that they can adopt different weights. They proposed that each unit should be allowed to adopt a set of weights that shows the most favourable light in comparison to the other units. DEA overcomes this problem, where units can be properly value inputs or outputs differently, or where there is a high uncertainty or disagreement over the value of some inputs or outputs by allowing each DMU to choose its own set of appropriate weights, so that its own efficiency rating is maximised. In this regard, the DEA Excel Solver developed by Zhu (2002) is used to solve the following models as summarised by Zhu. He summarises the cost efficiency model as

$$\min \sum_{i=1}^{m} p_i^o \tilde{x}_{io}$$

subject to

$$\text{CRS} \quad \sum_{j=1}^{n} \lambda_j x_{ij} \le \tilde{x}_{io} \qquad i = 1,2,\ldots,m; \qquad (4)$$

$$\sum_{j=1}^{n} \lambda_j y_{rj} \ge y_{ro} \qquad r = 1,2,\ldots,s;$$

$$\lambda_j, \tilde{x}_{io} \ge 0$$

Zhu summarise the revenue efficiency model as:

$$\max \sum_{r=1}^{s} q_r^o \, y_{ro}$$

subject to

$$\text{CRS} \quad \sum_{j=1}^{n} \lambda_j \, x_{ij} \le x_{io} \qquad i = 1,2,...,m; \tag{5}$$

$$\sum_{i=1}^{n} \lambda_j \, y_{rj} \ge \tilde{y}_{ro} \qquad r = 1,2,...,s;$$

$$\lambda_j, \tilde{y}_{ro} \ge 0$$

where p_i^o and q_r^o are the unit price of the input *i* and unit price of the output *r* of DMU_o, respectively. These price data may vary from one DMU to another. The cost efficiency and revenue efficiency of DMU_o is defined as

$$\frac{\sum_{i=1}^{m} p_i^o \, \tilde{x}_{io}^*}{\sum_{i=1}^{m} p_i^o \, x_{io}} \tag{6}$$

and

$$\frac{\sum_{r=1}^{s} q_r^o \, y_{ro}}{\sum_{r=1}^{s} q_r^o \, \tilde{y}_{ro}^*} \tag{7}$$

The cost and revenue efficiency scores are within the range of 0 and 1. Finally, Zhu defines the profit efficiency model as:

$$\max \sum_{r=1}^{s} q_r^o \, \tilde{y}_{ro} - \sum_{i=1}^{m} p_i^o \, \tilde{x}_{io}$$

subject to

$$\text{CRS} \quad \sum_{j=1}^{n} \lambda_j x_{ij} \le \tilde{x}_{io} \qquad i = 1,2,...,m$$

$$\sum_{j=1}^{n} \lambda_j \, y_{rj} \ge \tilde{y}_{ro} \qquad r = 1,2,...,s \tag{8}$$

$$\tilde{x}_{io} \le x_{io}, \tilde{y}_{ro} \ge y_{ro}$$

$$\lambda_j \ge 0$$

The profit efficiency of DMU_o is defined as

$$\frac{\sum_{r=1}^{s} q_r^o \, y_{ro} - \sum_{i=1}^{m} p_i^o \, x_{io}}{\sum_{r=1}^{s} q_r^o \, \tilde{y}_{ro}^* - \sum_{i=1}^{m} p_i^o \, \tilde{x}_{io}^*} \qquad (9)$$

3.4 Selection of Variables

Berger and Humphrey (1997) explain the difficulty of variable selection in performance appraisal of banks. They argue that there is 'no perfect approach' on the explicit definition and measurement of banks' input and output. In variables selection, there are some restrictions on the type of variables since there is a need for comparable data and to minimise possible bias due to different accounting practices as, even in the same country, different banks might use different accounting standards. In this respect, selection of variables clearly affects the results of efficiency scores.

In light of some previous studies (*e.g.* Isik and Hassan, 2002b; Hassan, 2005) the input vector consists of the following three variables: (i) labour; (ii) fixed assets (fixed capital); and (iii) total funds. The quantity of labour is measured by the staff costs, fixed capital by the book value of premises and fixed assets, and total funds by the sum of deposit (demand and time) and non-deposit funds as of the end of the respective year. Hence, the total banking costs include both interest expense and operating costs and are proxied by the sum of labour, capital, and total funds expenditures. All banks, within the intermediation framework in this study, are modelled as multi-product firms, producing three outputs employing three inputs. All input prices are proxied as flows over the year divided by these stocks: (i) price of labour: total expenditures on employees such as salaries, employee benefits, and reserves for retirement pay (staff costs), divided by the total funds, (ii) price of fixed assets: total expenditures on premises and fixed assets (depreciation) divided by the book value of premises and fixed assets, and (iii) price of total funds: total interest expenses on deposit and non-deposit funds plus other operating expenses divided by the total funds.

The output vector, on the other hand, includes the following three outputs: (i) total loans; (ii) other earning assets such as investment securities, specialised and directed loans, and inter-bank loans; (iii) off-balance sheet items. The total revenue created by these outputs is the dependent variable in the revenue function. Whereas, the revenues created by these outputs, after accounting for the expenses in their production, make up the dependent variable in the profit function. In other words, net income (interest and non-interest income) is used as a proxy for the regressing in the revenue equation, while the operating expenses (interest and non-interest expense) and taxes deducted from the net income before it is used as a proxy for the regressing in the profit equation.

4. Results and Conclusions

4.1 Overall Efficiency Results: Conventional, Islamic, and All Banks

A bank can be said to be cost efficient if it can create a relatively high volume of income-generating assets and liabilities for a given level of capital. A revenue and profit efficient bank can generate a relatively high volume of income from its services and intermediation operations with the given level of inputs. This is the basis used to measure and compare these three aspects of efficiency of banks.

Table 1 provides a summary of descriptive statistics: the average cost, revenue, and profit efficiency scores for all banks in the sample.[4] These scores are 92.1, 78.2, and 82.7 percent, respectively. On average, there is a considerable level of *in*efficiency of banks in this study. Another way of interpreting this result is to suggest that these banks have slacks in not fully using the resources efficiently to produce the same outputs. Therefore, the levels of inefficiency are 8.6, 27.9, and 20.9 percent, respectively in producing the outputs.[5] The same outputs could have been produced by that many percentages of fewer inputs. The average cost efficiency ranges between 71.7 to 100 percent with 8.1 percent standard deviation. Revenue and profit efficiency ranges between 26.4 to 100 percent and 29.2 to100 percent with standard deviations 18.6 and 19.5 percent, respectively.

These results mean that the average bank could have used only 92.1 percent of the resources actually utilised to produce the same level of output. In other words, the average bank has wasted 8.6 percent of its inputs, or it needed 8.6 percent more inputs to produce the same level of outputs. Hence, there was substantial room for significant cost savings for these banks if they have had employed their inputs more efficiently. However, it was noted that, on average, banks are more efficient in using their resources compared to their ability to generate revenues and profits. For revenue efficiency, the average bank could only generate 78.2 percent of the revenues it was expected to generate if it was 100 percent efficient. Thus, there is a slack of 27.9 percent, meaning that the average bank lost an opportunity to receive 27.9 percent more revenue, giving the same amount of resources. Clearly, the highest level of inefficiency is on the revenue side, followed by the profits. Similarly, the average bank could earn 82.7 percent of what was available, and lost the opportunity to make 20.9 percent more profits utilising the same level of inputs.

Table 1: Descriptive Statistics: Cost, Revenue, and Profit of Conventional, Islamic and All Banks

[4] All the results in the paper are based on CRS assumption.

[5] The relationship between efficiency (E) and inefficiency (IE) is IE= (1-E)/ E. Thus, the 92.1 percent efficiency implies 8.9 percent inefficiency, not 8.6 percent (or not 1-0.921). See Isik and Hassan (2002a).

Banking Group Specialization	Descriptive Statistics	Cost Efficiency	Revenue Efficiency	Profit Efficiency
Conventional Banks	N	18	18	18
	Mean	**0.927**	**0.730**	**0.807**
	Standard Deviation	0.068	0.201	0.161
	Maximum	1.00	1.00	1.00
	Minimum	0.754	0.264	0.437
Islamic Banks	N	22	22	22
	Mean	**0.915**	**0.825**	**0.843**
	Standard Deviation	0.091	0.164	0.222
	Maximum	1.00	1.00	1.00
	Minimum	0.717	0.352	0.292
Significance Test (Mann-Whitney)	**Asymp. Sig. (2-tailed)**	**0.96**	**0.07**	**0.13**
	Exact Sig. [2*(1-tailed Sig.)]	**0.97(a)**	**0.07(a)**	**0.13(a)**
Total	N	40	40	40
	Mean	**0.921**	**0.782**	**0.827**
	Standard Deviation	0.081	0.186	0.195
	Maximum	1.00	1.00	1.00
	Minimum	0.717	0.264	0.292

(a) Not corrected for ties.

Table 1 also presents the summary statistics of the efficiency measures calculated relative to separate frontiers for both banking streams for the years 1990–2005. Based on the results in this table, we can compare the cost, revenue, and profit efficiency of conventional versus Islamic banks.

On average, conventional banks scored 92.7 percent cost efficiency, 1.2 percent higher than their Islamic counterpart, which had average score of 91.5 percent. In contrast, Islamic banks slightly outperformed conventional banks in respect to revenue and profit efficiency. In particular, revenue and profit efficiency of Islamic banks are 82.5 and 84.3 percent, respectively compared to 73 and 80.7 percent for conventional banks. In fact, the results are consistent with the findings documented in the literature. It is noteworthy that both banking system are better in utilising inputs more than generating optimal outputs. Perhaps, this is due to the ability of banks' management to better control the usage of their internal resources rather than controlling the outcomes which is normally influenced by external factors such as competition, regulations, GDP, and other macroeconomic factors. Also, assuming full capacity usage in the model is a limiting factor, since, on average, not all banks could use full capacity.

The Mann-Whitney U test statistics summarised in Table 1 does not indicate any significant results; all *p* values are greater than the standard level at 5 percent. The output indicates that the result, with correction for ties and Z-scores conversion, were not significant ($p > 0.05$) implying no significant differences in efficiencies exist between conventional and Islamic banks.

4.2 Efficiency of Big versus Small Banks

The literature documents relationship between size and level of efficiencies of banks (*e.g.* Bos and Kool, 2006; Kwan, 2006). Size is an important factor that affects the variation in efficiency across banks. Hence, to operate at optimal level of scale and scope economies, firms should posses a certain size (Isik and Hassan, 2002a). In addition, high competitive pressures might induce more incentives for smaller banks to be efficient. The literature is inconclusive with respect to evidence on efficiency differences between different sizes of banks. Berger, Hancock and Humphrey, (1993) and Miller and Noulas, (1996) documented significant positive relationship, whereas significantly negative relationship was observed by Kaparakis, Miller, and Noulos (1994) and DeYoung and Nolle (1996). Other studies did not find any efficiency advantage in different size of banks (Pi and Timme, 1993; Berger and Mester, 1997).

Table 2 summarize the efficiency scores for big and small banks in general, and big and small conventional and Islamic banks. The findings in the table shows that, on average for the overall sample, big banks are relatively more cost, revenue and profit efficient than small banks. However, the difference is not statistically significant implying no real differences in efficiency between big and small banks. It is apparent from this table that big conventional banks slightly outperform big Islamic banks in the cost and profit efficiency measures. Meanwhile, big Islamic banks outperform big conventional banks in respect to revenue efficiency. This might be due to huge capital and longer history of big conventional banks compared to big Islamic banks with shorter history and smaller capital. However, the differences between the mean efficiencies were not statistically significant.

Interestingly, Table 2 shows that cost, revenue, and profit mean efficiency scores for small Islamic banks are higher than small conventional banks. This relatively better efficiency could be due to smaller differences in terms of capital size and history, and also the stiff competition among small conventional banks that affects their revenue and profits efficiency.. However, the differences are not statistically significant, implying no difference in efficiency between small banks in both streams.

4.3 Efficiency of Old versus New Banks[6]

Besides size another variable of interest that could affect efficient scores is the age of the bank. A strong relationship has been reported in the literature between bank efficiency and their age (Fries and Taci, 2005). To date there is no documentation in the literature on the impact of age on efficiency scores of Islamic banks compared to conventional banks. This section discusses the analysis of the impact of age on cost, revenue and profit efficiency in all banks, conventional banks, and Islamic banks group.

Table 2: Descriptive Statistics: Average Cost, Revenue, and Profit Efficiency Scores for Big versus Small Banks

[6] Old banks are those that have been established before 1990, while new banks are those that have been established from 1990.

Banking Group Size Classification	Descriptive Statistics	Cost Efficiency	Revenue Efficiency	Profit Efficiency
Big Banks	N	20	20	20
	Mean	**0.927**	**0.835**	**0.853**
	Standard Deviation	0.084	0.118	0.166
	Maximum	1.00	1.00	1.00
	Minimum	0.717	0.530	0.297
Small Banks	N	20	20	20
	Mean	**0.915**	**0.729**	**0.801**
	Standard Deviation	0.079	0.225	0.222
	Maximum	1.00	1.00	1.00
	Minimum	0.754	0.264	0.292
Significance Test (Mann-Whitney)	**Asymp. Sig. (2-tailed)**	**0.52**	**0.14**	**0.78**
	Exact Sig. [2*(1-tailed Sig.)]	**0.53(a)**	**0.15(a)**	**0.78(a)**
Big Conventional	N	9	9	9
	Mean	**0.954**	**0.791**	**0.878**
	Standard Deviation	0.039	0.134	0.097
	Maximum	0.993	0.939	0.980
	Minimum	0.873	0.530	0.754
Big Islamic	N	11	11	11
	Mean	**0.904**	**0.872**	**0.833**
	Standard Deviation	0.104	0.094	0.209
	Maximum	1.00	1.00	1.00
	Minimum	0.717	0.657	0.297
Small Conventional	N	9	9	9
	Mean	**0.901**	**0.670**	**0.737**
	Standard Deviation	0.082	0.244	0.187
	Maximum	1.00	1.00	1.00
	Minimum	0.754	0.264	0.437
Small Islamic	N	11	11	11
	Mean	**0.926**	**0.778**	**0.854**
	Standard Deviation	0.078	0.207	0.244
	Maximum	1.00	1.00	1.00
	Minimum	0.777	0.352	0.292
Significance Test (Kruskal-Wallis)	**Asymp. Sig.**	**0.69**	**0.14**	**0.19**

(a) Not corrected for ties.

Table 3 summarize the statistics on age and overall efficiency for all banks and conventional versus Islamic banks. The findings in the table show that, on average, new banks had slightly higher cost, revenue, and profit efficiency compared to old banks.

Table 3: Descriptive Statistics of Cost, Revenue, and Profit Efficiency Scores of Old and New Conventional and Islamic Banks

Banking Group Age- Specialization	Descriptive Statistics	Cost Efficiency	Revenue Efficiency	Profit Efficiency
Old Banks	N	30	30	30
	Mean	**0.912**	**0.762**	**0.786**
	Standard Deviation	0.082	0.187	0.207
	Maximum	1.00	1.00	1.00
	Minimum	0.717	0.264	0.292
New Banks	N	10	10	10
	Mean	**0.948**	**0.842**	**0.951**
	Standard Deviation	0.073	0.177	0.074
	Maximum	1.00	1.00	1.00
	Minimum	0.754	0.539	0.768
Significance Test (Mann-Whitney)	**Asymp. Sig. (2-tailed)**	**0.17**	**0.15**	**0.005***
	Exact Sig. [2*(1-tailed Sig.)]	**0.18(a)**	**0.15(a)**	**0.004(a)***
Old Conventional	N	16	16	16
	Mean	**0.937**	**0.724**	**0.801**
	Standard Deviation	0.056	0.212	0.167
	Maximum	1.00	1.00	1.00
	Minimum	0.826	0.264	0.437
Old Islamic	N	14	14	14
	Mean	**0.883**	**0.805**	**0.769**
	Standard Deviation	0.099	0.149	0.249
	Maximum	1.00	0.939	1.00
	Minimum	0.717	0.352	0.292
New Conventional	N	2	2	2
	Mean	**0.855**	**0.777**	**0.860**
	Standard Deviation	0.143	0.089	0.131
	Maximum	0.956	0.839	0.953
	Minimum	0.754	0.714	0.768
New Islamic	N	8	8	8
	Mean	**0.972**	**0.859**	**0.973**
	Standard Deviation	0.029	0.194	0.042
	Maximum	1.00	1.00	1.00
	Minimum	0.918	0.539	0.906
Significance Test (Kruskal-Wallis)	**Asymp. Sig.**	**0.09**	**0.20**	**0.02***

(a) Not corrected for ties.

* Significant at 5percent level.

The Mann-Whitney test shows that there are no significant differences between old and new banks in respect to cost and revenue scores; implying no efficiency differences between new and old banks in this sample.

It is also apparent from the findings reported in Table 3 that the cost and profit efficiency of old conventional banks are slightly better than old Islamic banks; the reverse applies to revenue efficiency. This can be justified by the consequences of the difference in time period experienced in old and new banks categories. This set of results indicates that the old conventional banks are slightly more cost and profit efficient than old Islamic banks. It should be noted that since old conventional and Islamic banks are less revenue and profit efficient compared to cost efficiency, there should be efforts towards improving these efficiencies. Old Islamic banks need to reformulate business strategies based on the need of new Islamic banks to improve their profit performance.

The findings on comparative cost, revenue and profit efficiencies between new conventional and new Islamic banks show favourable efficiency preferences toward small Islamic banks. Further, new Islamic banks are significantly more profit efficient than new conventional banks (p value = 0.02). These results indicate the ability of new Islamic banks to perform better within its peer group compared to the old Islamic banks.

The superior performance of new Islamic banks might be due to their advantage of learning from the experiences of older Islamic banks. Another explanation to this apparent good performance could be due to the fact that they did not experience the difficult times during financial crisis of 1997 to 1998, as they were established after the period. The better performance of new Islamic banks reflects its acceptance as a viable and profitable banking system. However, to survive the highly competitive industry new Islamic banks need to seriously work to improve their cost and revenue efficiency.

5. Conclusion

The main objective of banks, both conventional and Islamic, is to maximise shareholders values; however, in Islamic banking, this objective must be achieved based on *Shari'ah* principles. Stakeholder parties are interested in evaluating the overall financial performance of banks to find out to what extent this objective is achieved. The performance of bank directly affects these stakeholders: Customers, employees (including managers), Governments (including regulators), investors, and society as a whole. Each group needs to evaluate the performance of banks so as to help them to assess the past outcome from the bank operations and to make better future decisions. In this regard, cost and profit efficiency are crucial elements in measuring performance.

Banking business, similar to other industries, is changing and developing very fast due to the increased competition, spread of globalisation, communication revolution, and new regulations. In that sense, needless to say banks cannot escape these changes and developments. They must, continuously, keep abreast with these developments and follow-up their performance to take their decisions and adjust their strategies accordingly. Backinsell (2001) noted that an organisation that can

measure itself at every level against a common corporate vision posses a potential competitive advantage.

The findings in this paper indicate that there is a slack in the usage of resources across all banks, as measured by the efficiency results of the average bank. Therefore, there is substantial room for more cost, revenue, and profit efficiency in both banking systems. That means the slack needs to be removed. Table 4 provides a summary of the mean cost, revenue, and profit efficiency scores for all banks categories.

The overall efficiency results of all banks in the sample selected in this paper show that the average bank is better in utilising its resources than in generating profits and that most inefficiency is observed from revenue side. Thus, both conventional and Islamic banks had to improve their revenue efficiency. One of the main and important insights implied by the findings is that there is no significant difference between the overall efficiency results of conventional versus Islamic banks. That is good news in that the banking transactions compliant with the *Shari'ah* are not an impediment to efficiency. However, new banks, significantly, outperformed old banks in respect to profit efficiency. In addition, new Islamic bank's mean profit efficiency score is significantly higher than new conventional banks. Hence, conventional banks should find the sources of their inefficiency in respect to profit.

Table 4: Cost, Revenue, and Profit Efficiency Mean Scores for all Groups of Banks

#	Banks	N	Cost Efficiency	Revenue Efficiency	Profit Efficiency
1.	All	40	0.921	0.782	0.827
2.	Conventional Banks	18	0.927	0.730	0.807
3.	Islamic Banks	22	0.915	0.825	0.843
4.	Big Banks	20	0.927	0.835	0.853
5.	Small Banks	20	0.915	0.729	0.801
6.	Big Conventional Banks	9	0.954	0.791	0.878
7.	Big Islamic Banks	11	0.904	0.872	0.833
8.	Small Conventional Banks	9	0.901	0.670	0.737
9.	Small Islamic Banks	11	0.926	0.778	0.854
10.	Old Banks	30	0.912	0.762	0.786
11.	New Banks	10	0.948	0.842	0.951
12.	Old Conventional Banks	16	0.937	0.724	0.801
13.	Old Islamic Banks	14	0.883	0.805	0.769
14.	New Conventional Banks	2	0.855	0.777	0.860
15.	New Islamic Banks	8	0.972	0.859	0.973

Taken together, these findings suggest that there are substantial room for more cost minimisation, and revenue and profit maximisation in both banking systems. To some extent, conventional banks behave similarly as Islamic banks in respect to efficiency. On average, unlike age, the size differences do not contribute towards efficiency differences between both streams.

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