Investigating Economical Performance for UAE Islamic Banks versus Commercial Banks

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Abstract: **Banks are financial intermediates between depositors and borrowers. The backbone of the economy for any country related directly to the economics performance of the banking sector which included Islamic banks and commercial banks that play a crucial role in any society. Dubai has emerged as a global city of the Gulf region and it is increasingly developing as a business hub for service industries such as IT and Finance. The Emirate's Western-style model of business drives its economy, and more than 90% of the main revenues currently coming from various aspects rather than financial services. Therefore analyzing the economical efficiency of this sector in Dubai is very important. Data Envelop Analysis (DEA) technique is one of the most famous tools to evaluate the efficiency of a set of Organizations or Decision Making Units, and it is an application of the mathematical programming optimization. DEA offers a variety of models that use multiple inputs and outputs to compare the efficiency of two or more entities. The economics efficiency and performance for any institution consists of two types of efficiencies; the technical efficiency that indicates the ability to gain the maximum production by the available inputs, and the locative efficiency that indicates the ability to use the best mix for inputs by considering prices and available production technology. In this article the DEA model will be applied for measuring the economical performance for commercial Banks versus Islamic Banks in Dubai. The considered financial indicators to analyze the economics performance are the Deposits and Cash & BCB (cash and balances in central bank) as inputs for the model in both Islamic and commercial Banks, while the investments and the Loans in commercial banks and Murabaha in Islamic banks (instead of loans in commercial banks) are considered as outputs.**

Keywords: **Islamic Banks, Commercial Banks, Data Envelop Analysis, economical performance, Deposits, Loans, Cash & BCB, and investments.**

I.   INTRODUCTION

Economic globalization is a natural development of the global labor division and cooperation, with the support of modern science and technology. This trend is irreversible. It involves every nation, covers most facets of socioeconomic life, promotes competition, and strengthens cooperation while increasing the interdependence between economies. In this competitive environment, banks are forced to examine their performance because their survival will be dependent upon their productive efficiencies [3]

Commercial Banking*:*   the autonomy and accountability of the commercial banks for their business have been institutionalized and enhanced in practice. Commercial banks have the rights to decide on deposit and lending interest rates and to select their own method of loan security. Neither institution nor individual can illegally intervene in the operation of the commercial banks. Directed credit or policy-oriented lending is being separated from commercial credit. The international principles and standards for commercial banking (e.g., accounting and auditing, risk management, credit analysis, investment, foreign exchange, and loan classification and provisioning) have been gradually introduced to UAE. Banking products and services have become more diverse [6,7,9].

Bank efficiency: The term technical efficiency can be defined as the minimization of inputs, which are used for the production of a given set of outputs. Alternatively, technical efficiency is achieved with the maximization of outputs, from the use of a given set of inputs (Kumbhakar & Lovell 2000). From this, it is clear that a production unit or economic entity is said to be operating at technically inefficient levels when it uses an excessive amount of inputs or produces a lesser than optimal outputs [5,8].

In recent years the performance measurement concerns for financial institutions have attracted a great deal of attention. Given that the structures of financial service industries are changing rapidly, it is of considerable interest to measure the efficiency of evolving institutions, and explain measured variation in, the inefficiency of institutions. Many studies have attempted to analyze efficiency issues by using non-parametric techniques.

Sherman and Gold (1985), Parkan (1987), Ferrier and Lovell (1990), Zaim (1995), Jackson *et al* (1998), Contribute on this type of research.

DEA as a production frontier approach first suggested by Farrell (1957) and later popularized by Charnes et al. (1978). This approach as a non-parametric linear programming-based technique measures the relative efficiency of organizational units, namely, known as "decision-making units (DMUs)" – against the group's observed best practice by constructing the "best-practice" frontier (Bhagavath, 2006).

In this paper, we argue that DEA is an appropriate model to benchmark commercial banks around the UAE.

The UAE banking sector is Having served as a financial center for the Middle East region, the UAE banking institutions need to revaluate their performance.[10]

Moreover, the financial sector needs to compare its economic efficiencies with the competitors from around the world who soon might be able to enter the UAE market and seize part of the local share [12,16].

It is a matter of vital importance for bank managers, bank regulators, and the Central Bank authority of the UAE to get full information about the bank's economic efficiencies (technical, locative and scale efficiencies). To this end, the current study provides estimates of the various efficiency scores for the UAE banking sector, investigates the types of inefficiencies (if any) and identifies their sources [3].

Islamic Banks: is banking activity that is consistent with the principles of sharia and its practical application through the development of Islamic economics. As such, a more correct term for 'Islamic banking' is 'Sharia compliant finance'.

Sharia prohibits acceptance of specific interest or fees for loans of money (known as riba, or usury), whether the payment is fixed or floating. Investment in businesses that provide goods or services considered contrary to Islamic principles (e.g. pork or alcohol) is also haraam ("sinful and prohibited"). Although these prohibitions have been applied historically in varying degrees in Muslim countries/communities to prevent un-Islamic practices, only in the late 20th century were a number of Islamic banks formed to apply these principles to private or semi-private commercial institutions within the Muslim community.[15,17,19]

As of 2014, sharia compliant financial institutions represented approximately 1% of total world assets.[4] By 2009, there were over 300 banks and 250 mutual funds around the world complying with Islamic principles. and as of 2014 total assets of around $2 trillion were sharia-compliant. According to Ernst & Young, although Islamic Banking still makes up only a fraction of the banking assets of Muslims, it has been growing faster than banking assets as a whole, growing at an annual rate of 17.6% between 2009 and 2013, and will grow by an average of 19.7% .

Murabahah: This concept refers to the sale of goods at a price. This includes a profit margin agreed to by both parties. The purchase and selling price, other costs, and the profit margin must be clearly stated at the time of the sale agreement. The bank is compensated for the time value of its money in the form of the profit margin. This is a fixed-income loan for the purchase of a real asset (such as real estate or a vehicle), with a fixed rate of profit determined by the profit margin. The bank is not compensated for the time value of money outside of the contracted term (i.e., the bank cannot charge additional profit on late payments); however, the asset remains as a mortgage with the bank until the default is settled.

This type of transaction is similar to rent-to-own arrangements for furniture or appliances that are common in North American stores.[30,33]

II.   GENERAL MODEL OF DEA

The basic DEA model for 'n' DMUs with 'm' inputs and 's' outputs was first proposed by A. Charnes, et al [2]. The model determines the relative efficiency score for the different DMUs. The model depends on maximizing a production function estimated by DEA. This function is a deterministic frontier. For any inputs, the value of the DEA estimate defines the maximum output producible from inputs under all circumstances. On the other hand, for any outputs, the value of the DEA estimate defines the minimum input producing a given output under all circumstances. In this sense, it is comparable to the parametric frontier with one-sided deviations estimated using mathematical programming methods.[2,5]

According to the assumptions relating the change in outputs as a result of the change in inputs, the DEA model can be classified as having either constant returns to scale (CRS) or variable returns to scale (VRS). Under CRS models the outputs are not affected by the size of the DMU, rather they change in direct proportion to the change in inputs assuming that the scale of operation does not influence efficiency; therefore, in the CRS models the output and input oriented measures of efficiency are equal. Under VRS models, changes in outputs are not necessarily proportional to the changes in the inputs; therefore In the VRS models the output and input oriented measures of efficiency scores are not equal for inefficient units [3]. In this paper we concerned about input oriented VRS model, the model is as follows:

$$\text{Min} \quad Z_p = \theta$$

s.t.

$$\sum_{i=1}^{n} \lambda_i x_i \leq \theta x_p \qquad , \forall j = 1, \dots m$$

$$\sum_{i=1}^{n} \lambda_i y_i \geq y_p \qquad , \forall k = 1, \dots s \qquad (1)$$

$$\sum_{i=1}^{n} \lambda_i = 1$$

$$\lambda_i \geq 0 \qquad , i = 1, \dots n$$

The selected Banks (Islamic and Commercial):

TABLE I. LIST OF THE SELECTED BANKS

Banks	Bank Name
NAB	**National bank of Abu Dhabi**
NDB	**National bank of Dubai**
SHB	**Bank of Sharjah**
EIB	**Emirates Bank International**
IAB	**Abu Dhabi Islamic bank**
IDB	**Dubai Islamic bank**
ISB	**Sharjah Islamic bank**
IEB	**Emirates Islamic bank**

III.   DATA DESCRIPTION AND ANALYSIS

In this section, the data for the selected 8 banks are tabulated and represented graphically using the Pareto graphs, and some comments on the performance of the banks are discussed. The data related to the chosen investigated period of five consecutive years (2002 to 2006) were extracted from the "Local Shares Directory catalogue" for the United Arab Emirates which published annually Abu Dhabi, the extracted data covers eight banks (four commercial banks and four Islamic banks) located at the UAE, table I shows the banks' list for both types of banks.[4,8,22]

Pareto Analysis is a technique used for decision making based on the Pareto Principle, known as the 80/20 rule. It is a decision-making technique that statistically separates a limited number of input factors as having the greatest impact on an outcome, either desirable or undesirable. Pareto analysis is based on the assumption that, in most of the situations, 20% of causes determine 80% of problems or 80% of a project's benefit can be achieved by doing 20% of the work.[32]

Pareto charts is one of the famous seven quality tools and it is useful where many possible courses of action are competing for attention, and it is a creative way of looking at causes of problems because it helps stimulate thinking and organize thoughts.

Figures 1 to 4 illustrate the Pareto representation of the Deposits amounts, Cash/Balance in Central Bank (BCB) amount, Loans/Murabaha amounts, and Investments amount respectively for the selected banks and its average line. It is noticed that there are some observations could be interpreted from the figure, those observations will summarized in the next paragraphs of the current section, and the mentioned comments are closely related with the interpretation of the obtained results of the main tool that used in this article (DEA) which discussed in the next section.

The most common observation is that the commercial banks take the first ranks of each of the four parameters while the Islamic banks take the lowest levels.

More observations could be extracted from the Pareto presentaion of the four parameters like, The National Bank of Abu Dhabi (NAB) represnts the first position among both the commercial banks and the Islamic banks for Deposit, Loans, and investments, while it comes in the fifth level of the Cash&BCB, which is a logical result and consistante with the policy of incouraging Loans and investments. The Bank of Sharjah (SHB) lies in the tail of the banks list in Deposit, Loans, and investments, whil it takes advanced level (fourt level) in Cash & BCB which reflects the opposite policy of the NAB. All Islamic banks under average for all selected parameters.

Tabble II rpresents the Deposits amounts for the selected banks and the average deposits ranging between 3000 and 50000 approximately, with standard deviations between 1000 and 21000 approximately which reflects the high disperssion of the data.

Tabble III rpresents the Cash & BCB amounts for the selected banks and the average deposits ranging between 200 and 2700 approximately, with standard deviations between 200 and 2300 approximately which reflects the high disperssion of the data.

Tabble IV rpresents the Loans & Murabaha amounts for the selected banks and the average deposits ranging between 2000 and 40000 approximately, with standard deviations between 1000 and 16000 approximately which reflects the high disperssion of the data.

TABLE II. DEPOSITS DISTRIBUTION FOR THE SET OF BANKS UNDER INVESTIGATION AND ITS STATISTICS

Input I - Deposits				
Banks	**2002**	**2003**	**2004**	**2005**	**2006**
NAB	34049.0	38153.8	41439.1	63200.8	76806.8
NDB	29397.8	29776.2	34484.3	42666.3	56050.4
SHB	1779.6	2021.3	2357.6	3721.9	4858.1
EIB	18869.6	22463.1	25151.9	42009.2	69907.7
IAB	6422.2	7708.6	11004.8	19733.1	29167.8
IDB	17229.2	20204.0	26334.2	37491.3	52382.4
ISB	1640.1	1895.9	2658.9	3072.8	4506.1
IEB	1228.7	1208.1	1249.3	3617.5	9102.1

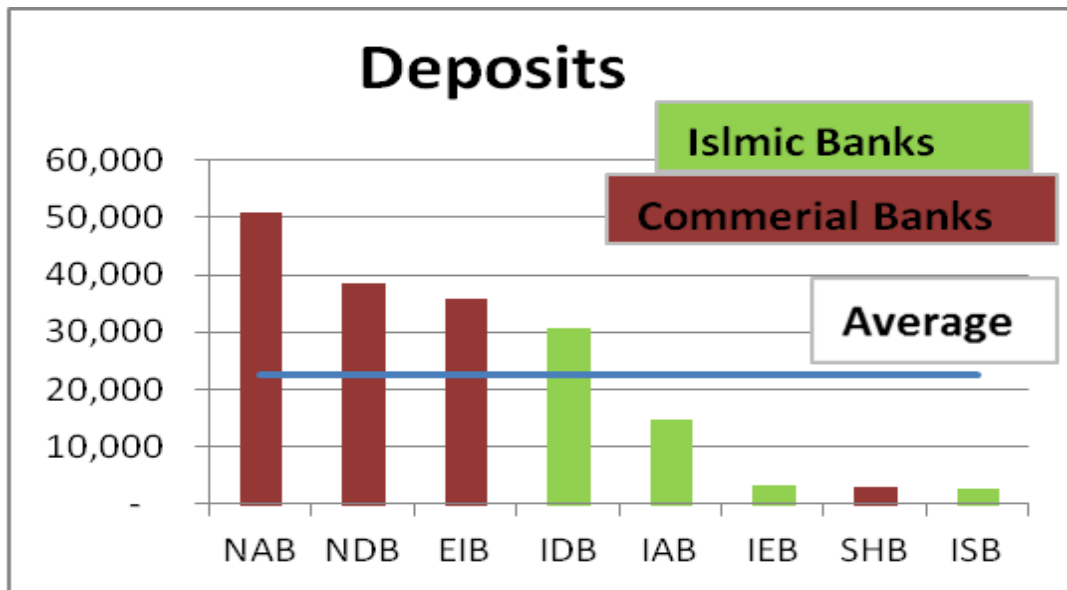| Input I - Deposits Statistics			
Banks	**Average**	**Range**	**SD**
NAB	50729.9	42757.8	18427.3
NDB	38475.0	26652.6	11185.4
SHB	2947.7	3078.5	1305.7
EIB	35680.3	51038.2	21093.3
IAB	14807.3	22745.6	9560.9
IDB	30728.2	35153.2	14378.2
ISB	2754.8	2866.0	1135.5
IEB	3281.1	7894.0	3414.5

Fig 1: Pareto representation of the Deposits amounts for the selected banks and its average line.

TABLE III. CHAS MONEY AND BCB DISTRIBUTION FOR THE SET OF BANKS UNDER INVESTIGATION AND ITS STATISTICS

Input II – Cash/BCB					
Banks	**2002**	**2003**	**2004**	**2005**	**2006**
NAB	1298.4	1314.8	1679.8	1702.3	1898.5
NDB	1923.3	1836.0	4308.1	2549.4	3128.1
SHB	1208.9	1075.5	1238.6	1832.1	3227.0
EIB	1123.2	1308.3	2570.8	2067.9	6778.4
IAB	343.5	474.6	605.5	1082.5	1408.3
IDB	1046.8	1244.8	2067.2	3166.1	3111.7
ISB	132.4	164.7	223.5	425.4	623.9
IEB	140.7	132.6	148.7	238.9	453.4

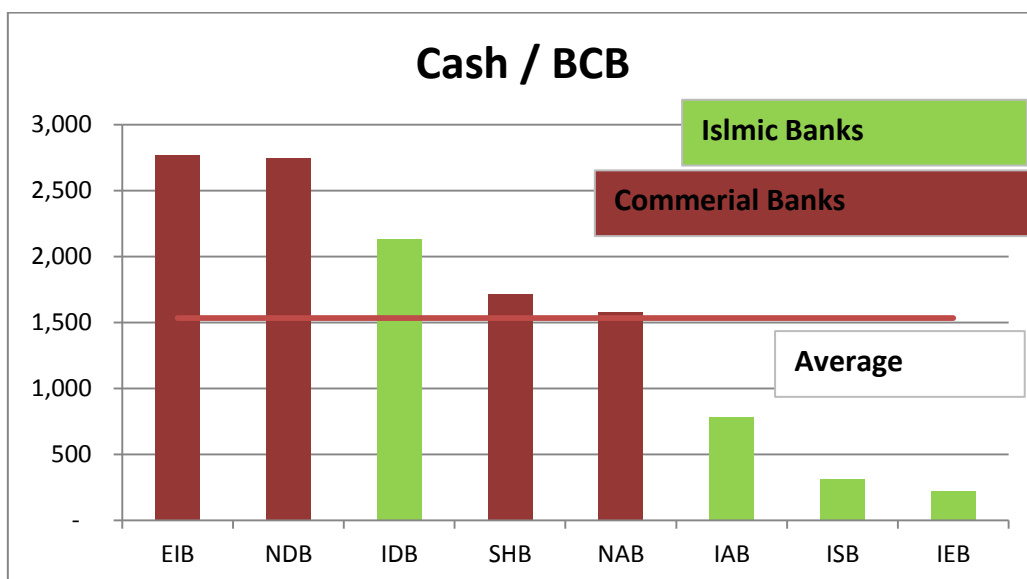| Input II – Cash/BCB Statistics			
Banks	**Average**	**Range**	**SD**
NAB	1578.8	600.0	262.6
NDB	2749.0	2472.0	1016.0
SHB	1716.4	2151.5	893.3
EIB	2769.7	5655.2	2315.6
IAB	782.9	1064.9	447.4
IDB	2127.3	2119.3	999.8
ISB	314.0	491.5	207.3
IEB	222.9	320.8	135.8

Fig 2: Pareto representation of the Cash/BCB amounts for the selected banks and its average line.

Tabble V rpresents the Deposits amounts for the selected banks and the average deposits ranging between 250 and 15000 approximately, with standard deviations between 300 and 6300 approximately which reflects the high disperssion of the data.Also we can conclude from table VI that there is a very wide range (almost twice the average except for the investment it reachs four times),

TABLE IV. LOANS AND MURABAHA DISTRIBUTION FOR THE SET OF BANKS UNDER INVESTIGATION AND ITS STATISTICS

Output I - Loans / Murabaha					
Banks	**2002**	**2003**	**2004**	**2005**	**2006**
NAB	24823.5	29094.0	35428.5	51468.0	57485.7
NDB	9239.9	11744.3	16619.9	27936.7	43218.2
SHB	1327.3	1545.5	2020.5	2502.4	3756.6
EIB	18915.4	23326.5	27036.4	38567.3	59278.2
IAB	6970.6	8032.6	11176.9	19385.1	30964.4
IDB	16227.3	19478.8	24989.7	33963.8	50246.7
ISB	2005.1	2272.4	2813.4	3458.2	4525.3
IEB	1972.4	2023.8	1921.0	3465.2	7740.4

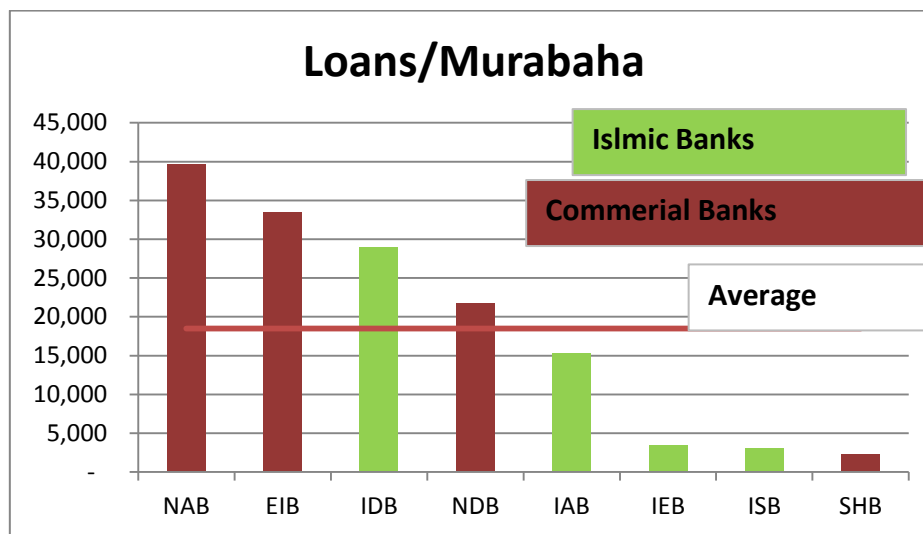| Output I - Loans / Murabaha Statistics			
Banks	**Average**	**Range**	**SD**
NAB	39659.9	32662.2	14202.6
NDB	21751.8	33978.3	13983.0
SHB	2230.5	2429.3	965.9
EIB	33424.8	40362.8	16187.6
IAB	15305.9	23993.8	10015.7
IDB	28981.2	34019.4	13655.9
ISB	3014.9	2520.3	1011.1
IEB	3424.5	5819.4	2498.0

Fig 3: Pareto representation of the Loans/Murabaha amounts for the selected banks and its average line

between the averages for each of the four parameters which reflects the high disperssion between the selected banks. It is worth to notice that the wide ranges reduced to 10% for the Islamic banks in both Cash & BCB and the Murabaha which reflects the standarization of the Islamic banks'policies.

TABLE V. INVESTMENT DISTRIBUTION FOR THE SET OF BANKS UNDER INVESTIGATION AND ITS STATISTICS

Output II - Investments				
Banks	**2002**	**2003**	**2004**	**2005**	**2006**
NAB	5151.8	7051.6	6974.4	9808.8	10935.0
NDB	13134.3	15568.5	14101.1	16184.2	17786.5
SHB	69.0	70.3	90.7	696.2	969.9
EIB	3747.4	3181.7	2736.2	7789.3	17895.3
IAB	421.8	628.7	791.8	1371.2	3287.9
IDB	1650.2	1503.9	2510.0	2848.7	5363.1
ISB	17.5	40.4	103.7	427.6	690.6
IEB	93.7	14.5	172.8	789.0	1887.4

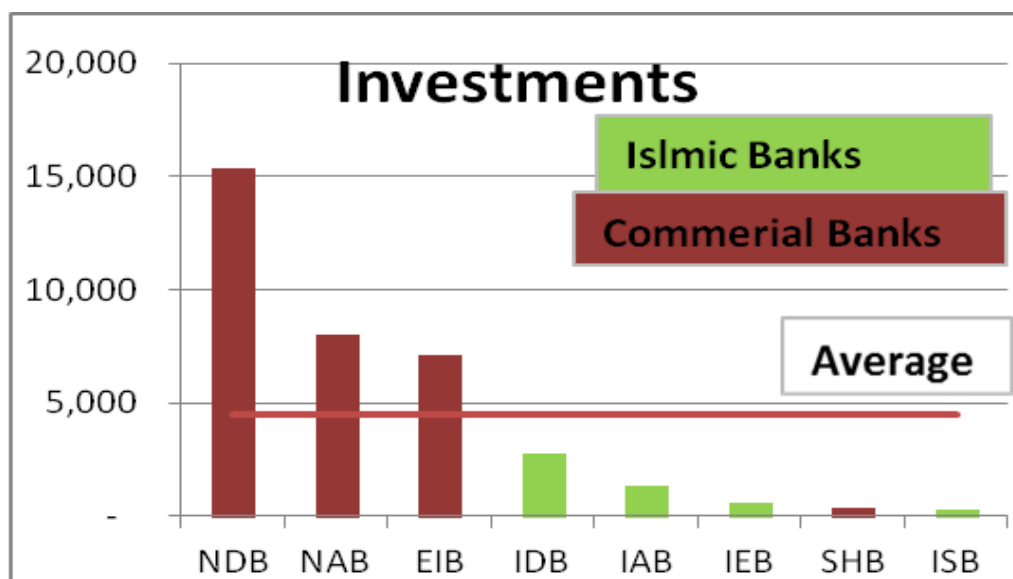| Output II - Investments Statistics		
Banks	**Average**	**Range**	**SD**
NAB	7984.3	5783.1	2342.4
NDB	15354.9	4652.3	1813.1
SHB	379.2	900.9	425.5
EIB	7070.0	15159.1	6376.6
IAB	1300.3	2866.1	1165.9
IDB	2775.2	3859.2	1553.6
ISB	256.0	673.1	293.6
IEB	591.5	1872.8	786.5

Fig 4: Pareto representation of the Investments amounts for the selected banks and its average line.

IV.   DATA ENVELOP ANALYSIS FOR THE BANKS' PARAMETERS

In this section the DEA approach is applied on the data of the selected eight banks that located at UAE. The banks represent the considered eight DMUs and two different input parameters are proposed in the model,

TABLE VI. GRAND AVERAGES AND AVERAGES RANGE FOR THE CHOSEN FOUR PARAMETERS

	Grand Average	**Average Range**
Cash & BCB	1,532.6	2,546.9
Deposit	22,425.5	47,975.1
Loan	18,474.2	37,429.5
Investment	4,463.9	15,099.0

(Cash & BCB, and Deposits) and the proposed outputs of the model are (Investments and the Loans) Banks' efficiency according to the dea methodology. According to the applied software there are five efficient banks (100%) which are "**National bank of Abu Dhabi**", "**National Bank of Dubai**", "**Islamic Abu Dhabi Bank**", and "**Islamic Sharjah Bank**" and "**Islamic Emirates Bank**", the comparison was made within the selected group of banks.

TABLE VII. BANKS' EFFICIENCY ACCORDING TO THE DEA METHODOLOGY

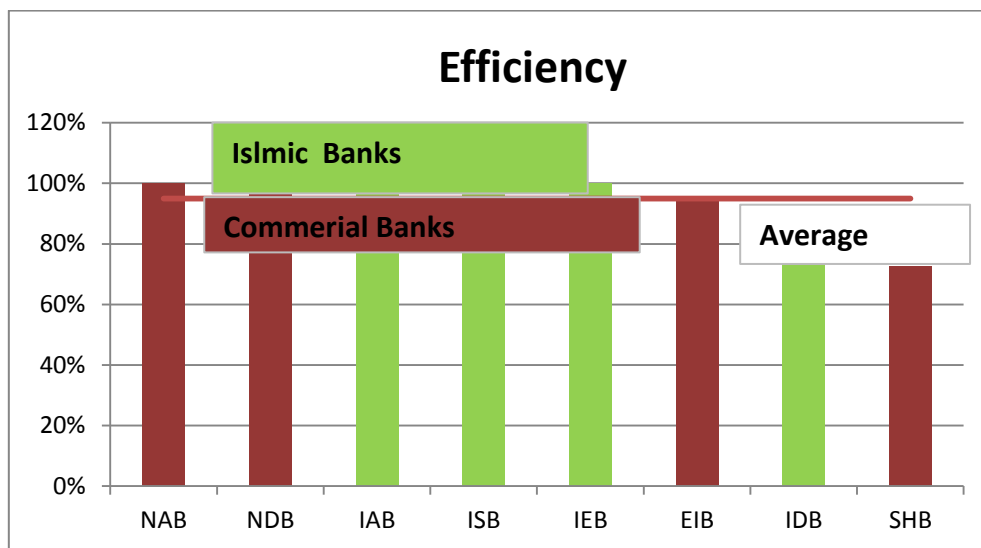| Banks	DMUs	Efficiency
NAB	DMU1	100%
NDB	DMU2	100%
IAB	DMU3	100%
ISB	DMU4	100%
IEB	DMU5	100%
EIB	DMU6	95%
IDB	DMU7	90%
SHB	DMU8	72%

Fig 5: Graphical representation of the banks' efficiency.

The DEA methodology concludes also that, there are two banks satisfy a strong efficiency (90% - 95%) which are "**Islamic Dubai Bank**" and "**International Emirates Bank**". Only one bank satisfies the week efficiency (72%) according to the DEA which is the **Sharjah Bank.**

V.   CONCLUSION

In this paper, The data related to the chosen investigated period of five consecutive years (2002 to 2006) were extracted from the "Local Shares Directory catalogue" for the United Arab Emirates which published annually Abu Dhabi, the extracted data covers sixteen commercial banks located at the UAE.

According to illustrate the Pareto distributions for the four different chosen parameters of the underlined study (Investments, Loans, Cash &BCB, and Deposits), the Pareto graphs considered the average during the five years. There are some observations could be interpreted from the figures, Most common observation is that the commercial banks take the first ranks of each of the four parameters while the Islamic banks take the lowest levels.

More observations could be extracted from the Pareto presentaion of the four parameters like, The National Bank of Abu Dhabi (NAB) represnts the first position among both the commercial banks and the Islamic banks for Deposit, Loans, and investments, while it comes in the fifth level of the Cash&BCB, which is a logical result and consistante with the policy of incouraging Loans and investments. The Bank of Sharjah (SHB) lies in the tail of the banks list in Deposit, Loans, and investments, whil it takes advanced level (fourt level) in Cash & BCB which reflects the opposite policy of the NAB. All Islamic banks under average for all selected parameters. the DEA approach is applied on the data of the selected eight banks that located at UAE. The banks represent the considered eight DMUs and two different input parameters are proposed in the model (Cash & BCB, and Deposits) and the proposed outputs of the model are (Investments and the Loans) Banks' efficiency according to the dea methodology. According to the applied software there are five efficient banks (100%) which are "National bank of Abu Dhabi", "National Bank of Dubai", "Islamic Abu Dhabi Bank", and "Islamic Sharjah Bank" and "Islamic Emirates Bank", the comparison was made within the selected group of banks. The most important result that although the Islamic banks show the lowest levels in pareto analysis. They show remarkable efficiency levels in DEA analysis that DEA measures the efficiency based on the consistency between its input and output.

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