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Assessing the efficiency of Islamic and conventional banks in the MENA banking system: Data Envelopment Analysis DEA investigation

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ABSTRACT: This study aims at measuring the banking technical efficiency levels in the Middle East and North Africa MENA region from the period 2010-2014 over six 06 countries (KSA, Qatar, Kuwait, Jordan, Tunisia, Algeria) using the nonlinear Data Envelopment Analysis DEA model based on an unbalanced panel data of 66 banks (47 conventional banks and 19 Islamic banks). The results suggest that conventional banks are more technical efficient than Islamic banks under the Constant returns to scale assumption. However, the efficiency scores vary across the sample under the Variable return scale assumption which reflect the importance of the size and economies of scale in determining the overall banking efficiency in the region.

KEYWORDS: Islamic banks, conventional banks, DEA, technical efficiency.

1 INTRODUCTION

The financial sector in many countries plays a key role in the process of economic growth, it deeply affects the allocation of financial resources and help to find their best productive investments by the most effective way that reduces the misallocation or the unnecessary losses of resources. The banking industry is usually the leading player in this process. Banks set prices, value financial securities and manage risks. Some studies show that banks' performance amplifies economic growth (for example by reducing transaction costs). While other studies demonstrate that bank failures can lead to systemic risks that can cripple the entire economy. Other investigations have even highlighted the significant effect of banks on sustainable development. Given the role of financial institutions and in the process of economic development, it is important to assess their efficiency and their productivity and analyze the determinants of their performance. Assessing the efficiency of financial institutions is useful to identify the best performing units and the worst performing ones. Such analysis, often by using frontier techniques, requires the development of banking models that appropriately capture the banks' objectives and activities. Nevertheless, the literature on the corporate banking and the specification of inputs and outputs implicitly assumed that banks focus in their appreciation of performance on purely accounting and financial criteria that focus on maximizing profits without taking into account other objectives linked to managerial and organizational aspects. In fact, assessing the company's performance also depends on the way that an organization operates and achieves its objectives. This performance refers to the company's ability to achieve its strategic goals by adopting the best practices. This generic notion encompasses various notions such as competitiveness, efficiency, value creation. In this study, we focus on analyzing the technical efficiency of banks.

The MENA countries have adopted a financial repression policy until the mid-eighties, then, opted for financial liberalization policies as part of the structural adjustment plans put in place by the Bretton Woods institutions. With the financial liberalization under way, banks have begun to look for new sources of income while developing new business models in order to diversify their resources. In this context, in order to determine the real efficiency of the banking sector, the analysis carried out through the traditional tools drawn from the accounting analysis, have become insufficient to the present day. The use of new efficiency indicators is urgently required as a result; it has become imperative in the performance analysis to look beyond the accounting approach that highlights the efficient and effective management of the resources available to banks.

Thus, this work aims implicitly to analyze the relationship, often ambiguous, between the efficiency of banks and financial performance. Several studies show that the correlation is not obvious, and that the most efficient institutions are not

necessarily the most profitable. Islamic banking has become one of the fastest growing segments of the financial market industry, operating through more than 300 institutions in 75 countries, as it deals with the principle of Sharia as laid down by the Holy-Quran and Sunnah.

There has been a lot of recent literature about Islamic banks and their ability to face conventional banks in the light of global openness and fierce competition in global markets. And after the 2008 global financial crisis, global attention has been focused on restructuring the financial system who could not withstand the crisis, so attention was drawn to the Islamic financial system that has stood firm in this crisis, because this system prohibits dealing with securitization the financial derivatives so far seen as unethical practices.

Comparative studies between Islamic and conventional banks have become the subject of many specialists and researchers. Efficiency measurement is among the most important investigated issues in comparative studies dealing with performance.

OBJECTIVES OF THE STUDY

The main objective of the study is to measure and compare the technical efficiency between the conventional and Islamic banks beyond traditional accounting measures, which emphasize on the profitability of assets and the technology of banking production. Thus, we will try in this work to develop appropriate models for the nonparametric evaluation of the technical efficiency. This study is in line with the objectives behind any efficiency analysis research, which focuses on three main directions that are not mutually exclusive:

- The first set of objectives is to inform government decision-makers by assessing the effects of different regulatory policies on efficiency at the industrial level. Variables capturing regulation include deregulation, mergers and acquisitions. Foreign capital inflows, market structure, privatization, and financial liberalization... etc. Analyzing the impact of these variables on efficiency could generate valuable information to guide policy makers to encourage, discourage or change a particular policy.
- The second set of objectives aims to improve the quality and robustness of methods and research questions in estimation. Questions that relate, for example, to the method of measurement based on the frontier, the definition of Inputs and Outputs, the specification of the functional form.., etc.
- The last set of objectives has been to provide useful information to managers in order to improve the managerial performance of a bank or a banking group. By building a Benchmark frontier, banks located on the efficient frontier or near "best-practice" may share some similarities in their managerial practices. Banks located far from the efficient frontier are considered "worst -practice". By identifying similarities and differences across the best and worst banks, managers tend to adopt best practices and use the worst practices as a benchmark to avoid making bad decisions. The end result would be improved efficiency at the industrial level.

RESEARCH QUESTION

Islamic banks have become modern in the middle of the economy through many scientists and researchers and try to compare them with conventional banks. Based on the above objectives we addressed the main research question:

What are the most technical efficient banks among Islamic and conventional banks in the MENA region?

RESEARCH HYPOTHESIS

Based on the previous empirical work that has been focused on assessing the efficiency of Islamic and conventional banks, multiple of hypothesis can be formulated:

H1: The Middle East's banks are more technical efficient in MENA system banking.

H2: Conventional banks are more technical efficient than Islamic banks because Islamic finance is still in early stages of development compared to the traditional Islamic system.

METHODOLOGY AND STRUCTURE OF THE STUDY

In this study, we have adopted a descriptive methodology in the theoretical chapters and we have applied a linear mathematical programming in the empirical study. We have divided our work in two distinct parts structured as follows: the

first part deals with the basic character of Islamic finance and banking. And in the empirical study, we applied the Data Envelopment Analysis DEA to measure the technical efficiency of both conventional and Islamic banks in the MENA region.

2 THEORETICAL BACKGROUND

Islam widely viewed as a religion can also be considered as a comprehensive socio-economic and political system for the Muslims, where it is necessary to apply the ethical principles of the Holy Quran and the 'Sunnah' (Prophet Muhammad's statements and actions). "Islamic economics refers to a system which identifies and promotes economic and financial orders that are consistent with the principles of Islamic law, the Shari'ah" [1].

Particularly, according to the Islamic law, the collection and payment of interest is prohibited. Muslims earnings must come from permissible means, and must also be spent on islamically acceptable categories of expenditure. Consequently, Islam prohibits investing in businesses that are considered illegal or contrary to the Islamic teachings and values. Moreover, the distribution of wealth is considered to be the primary concern in Islamic economics. Wealth in Islam should be shared, not become concentrated in few hands (rich people). For Muslims, concern for others, particularly the poor and the needy, is deeply inscribed in the pillars of Islam. Islam, therefore, encourages Muslims to maximize their wealth as long as they do not create a situation that is socially disruptive or violate the norms of Islamic justice. Muslims need financing services as much as anyone in order to finance their business ventures, to facilitate capital investment, and/or to undertake trading activities, etc. Muslims attempt to restructure their financial lives on the basis of Islamic law, and consequently to find out the means to fulfill their financial requirements in view of prohibition of interest in a world where the entire financial system is based on interest-usury. Their intent is to create a just, ethical and socially inclusive financial and business system across the broad spectrum of society. It is, therefore, the biggest challenge and the formidable task for them to reform their financial institutions, products and services, instruments and contracts on an interest-free basis in order to bring them in harmony with the dictates of Islamic law and within the constraints of Islamic regulations [2].

2.1 THE HISTORY OF ISLAMIC BANKING

The first Islamic saving bank was established in 1963 in Egypt that operates with the principles of profit-sharing, and since then the Islamic banking system has started to develop. Afterwards, the first Islamic financing system appeared in 1983 in Malaysia. Since 1970s, Islamic banking system has taken serious steps to consolidate its work and methods, and has made significant efforts to develop the structure and characteristics of these institutions [3]. These two wings can keep dealing with the issues of our day, the requirements of customers, and withstand many challenges that are offset of globalization and gigantism in the developed world. In this regard, in the local economies Islamic banks are growing fast in the market shares [4].

2.2 ORIGIN

We can trace the origin of the modern Islamic banks by going back to the birth of Islam when the "Prophet" himself acted as an agent for his wife's trading operations. Islamic partnerships (mudarabah), such partnerships performed an important economic function. They combined the three most important factors of production, namely: capital, labor and entrepreneurship, the latter two functions usually combined in one person. The capital-owner contributed the money and the partner managed the business. Each shared in a predetermined share of the profits. If there was a loss, the capital-provider lost his money and the manager lost his time and labor. (Institute of Islamic Banks and Insurance) [5].

2.3 WHAT IS ISLAMIC BANKING

An Islamic bank is a financial institution which identifies itself with the spirit of the Islamic legal code (Shari'a), as laid down by the Holy Quran and Sunnah, [6].

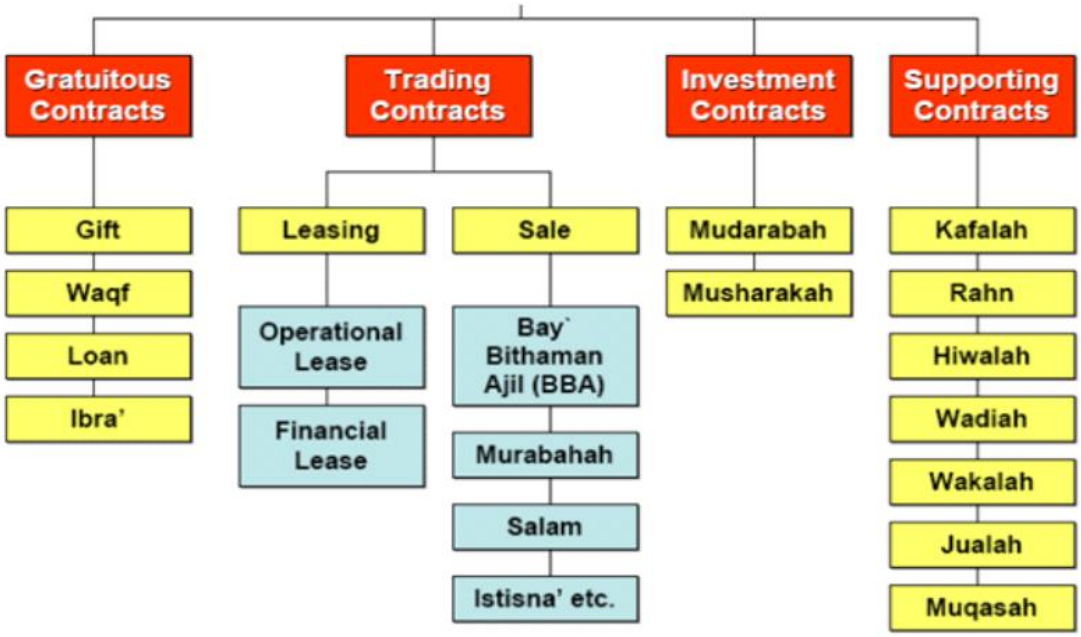

Fig. 1. Main shari'a contracts applied in Islamic banks

As shown in There is a variety of financial instruments are adopted by Islamic banking in operating their business. The other banks are known as conventional with an Islamic windowing; that is, they provide services to Muslims in accordance with Shari'a principles [7].

Through the development of Islamic economics, Islamic banking refers to a banking activity that is regular with the principles of Shari'ah (Islamic rulings) and its practical application [8]. The payment or acceptance of interest charges (riba) for the lending and accepting of money is prohibited in Shari'ah, as well as trading and do other activities that provide goods or services considered contrary to its principles.

Islamic banking has the same purpose as conventional banking except that it operates in accordance with the rules of Shari'ah, known as Fiqh al Muamalat (Islamic rules on transactions). Many of these principles upon which Islamic banking is based are commonly accepted all over the world, for centuries rather than decades [9]. These principles are not new but arguably, their original state has been altered over the centuries. The Holy Qur'an and the recorded sayings and actions of Prophet Muhammad (pbuh) – the Hadith is the principle source of the Shari'ah.Where solutions to problems cannot be found in these two sources, the source will based on the consensus of a community leaned scholars [10].

3 MATERIAL AND METHODS

In this empirical part we will investigate the technical efficiency of MENA banks (conventional and Islamic) using DEA model.

3.1 LITERATURE REVIEW

Despite the extensive literature conducted in efficiency measurement across the world, only studies have been done in the context of the MENA region, particularly, the empirical investigations that tackle the comparison between Islamic and conventional banks. Johnes, Izzeldin and Pappas, (2009) examined the efficiency of Islamic and conventional banks in the GCC countries over the period 2004 -2007using data envelopment analysis. The findings suggested that the average efficiency was significantly lower in Islamic banks than conventional banks [11]. In contrast, Abdul-Majid, Saal and Battisti (2010) found that the efficiency of the Islamic banks was more than the efficiency of the conventional banks over the period 1996-2002 using data from 10 countries (111 banks) [12].

Mostafa (2007a) examined the efficiency of the top 100 Arab conventional and Islamic banks from 14 countries in 2005 using DEA. The researcher employed two methods of DEA using CCR and BCC. However, the inputs of Mostafa's (2007a) study were: the capital and assets of the banks, whereas the outputs were: the profits, the return on equity (ROE) and return on

assets (ROA) of the banks us ed. The results showed that the Arabian banks of the study were inefficient, as only 4 banks scored 100% efficiency in both BCC and CCR scores. In other words, 96 banks were inefficient as they needed to reduce their inputs and increase their outputs to raise efficiency. The four efficient banks were from Egypt and the United Arab Emirates namely, the Cairo Bank and Egyptian American Bank from Egypt, and the National Bank of UAE and United Arab Bank from the United Arab Emirate [13]. In another study, Mostafa (2007b) examined 50 GCC Islamic and conventional banks using DEA of BCC and CCR in 2005, and he found that 5 banks achieved 100% efficiency of BCC and CCR [14]..

Comparing the cost and profit efficiency of Islamic and conventional banks, Olson and Zoubi (2011**)** studied the efficiency of 10 Middle Eastern and North African (MENA) countries. There was a large difference between the average cost and profit efficiency, scoring 70.3% and 59.4%, respectively. The conventional banks had higher cost and profit efficiency than Islamic banks with the conventional banks scoring cost and profit efficiency of 71.2% and 74.4%, respectively, whereas Islamic banks scored 66.4% and 59%, respectively. The disadvantage of this study can be observed that the model included many faded coefficients. In addition, macroeconomic variables have not been investigated to find the effect on efficiency [15].

3.2 DATA AND VARIABLES

The dataset comprises financial statements of (66) commercial banks between conventional and Islamic banks operating in six (06) Middle East and North Africa countries (10 conventional banks and 03 Islamic banks in Jordan, 08 conventional banks and 04 Islamic banks in KSA, 05 conventional banks and 06 Islamic banks in Kuwait, 07 conventional banks and 03 Islamic banks in Qatar, 09 conventional banks and 01 Islamic banks in Tunisia, 08 conventional banks and 02 Islamic banks in Algeria) during the 2010-2014 period. We focus on commercial banks to enhance the comparability within the banking systems of our sample; as such institutions are homogenous in terms of provided services. After reporting data from errors and other inconsistencies, we obtain an unbalanced panel data consisting of (330) bank-level observations.

The choice of the approach defining banking inputs and outputs is at the center of debate. A variety of approaches have been proposed in the literature, i.e. the intermediation, the production, the profitability, the portfolio and the Risk-return approaches. This is due to the nature and functions of financial intermediaries. In this study we follow the intermediation approach proposed by Sealey and Lindley (1977). This approach perceives banks as financial intermediaries between savers and investors that collect purchased funds and transform them to loans and other earning assets.

In this study, we follow the asset approach variation and we estimate a DEA model with two outputs and three inputs. The outputs are: total loans and other earning assets. In relation to the three inputs: we have total fixed assets, deposits and total expenses, the latter incorporates the interest expenses e, the non-interest expenses (personnel expenses + other operating expenses). To avoid a potential problem of multi-dimensionality due to the small size of our sample for each country, we aggregate total loans and other earning assets into one output, and we also aggregate deposits and total expenses into one single input. Therefore, we run the estimation of efficiency for one output and two inputs.

The bank's inputs and outputs data are obtained mainly from Bankscope Fitch international database published by Bureau. The database has comprehensive coverage of banks in a large number of countries and accounts for over 90% of all banking assets in each country. The Table (3.1) reports descriptive statistics of input – output variables adopted in this study for each country.

Table 1. Descriptive Statistics of input-output variables (values in national currency)

Algeria	Medium	STD	Min	Max
Total Outputs	180328,619	661370,238	56077	2100560
Input 1	7526,77273	6311,30178	996	18000
Input 2	497119,563	394074,964	90381	1136900
Tunisia	**Medium**	**STD**	**Min**	**Max**
Total Outputs	5918,33333	2286,45803	3509	8058
Input 1	582,166667	787,181406	39	1598
Input 2	3665,40704	3109,33746	216,7	12802,1
KSA	**Medium**	**STD**	**Min**	**Max**
Total Outputs	139632,59	91035,2668	21185,6	408420,2
Input 1	1494,73333	1178,5132	286,4	5578,9
Input 2	130188,257	87903,8923	21124,4	380102,9
Kuwait	**Medium**	**STD**	**Min**	**Max**
Total Outputs	4720,42364	5069,45965	106	19078,9
Input 1	109,501818	204,175946	1	877,4
Input 2	4739,12364	5171,84594	28,7	20417
Qatar	**Medium**	**STD**	**Min**	**Max**
Total Outputs	29846,375	15793,1531	16133	58662
Input 1	586,333333	559,311958	87	1391
Input 2	51169,268	71486,8961	292,3	352970,1
Jordan	**Medium**	**STD**	**Min**	**Max**
Total Outputs	2876,75385	4920,80939	76	20016,5
Input 1	45,5676923	53,9926095	1,7	220,7
Input 2	3045,17538	5088,95186	10,9	20584,8

3.3 THE DATA ENVELOPMENT ANALYSIS

In the present study, we follow the non-parametric Data Envelopment Analysis (DEA) to estimate bank specific efficiency levels. DEA is a linear programming technique that allows calculating relative efficiency of a business unit. It was developed by Charnes, Cooper and Rhodes in 1978 (CCR) in order to measure relative efficiency without knowing what variables are more important or what their relationship is [16].

The non-parametric measurement of DEA creates a piecewise linear convex frontier that envelops the input-output of all banks in the sample relative to which inputs are minimized or outputs are maximized. Efficiency scores are then calculated from the frontier generated by a sequence of linear programs. Each bank is assigned an efficiency score between 0 and 1 with higher score indicating the most efficient bank. We opted for the DEA approach because of the many advantages this non-parametric offer for the analysis. The main reasons is that DEA works relatively well with efficiency analysis involving small samples and it does not require any assumption regarding the distribution of inefficiency and the functional form of the production function. However, DEA suffers from some drawbacks as it remains sensitive to outliers and assumes data to be free of measurement error [17].

Under the assumption that managers of banks have higher control over the inputs (e.g. personnel or operating expenses) rather than outputs, we adopt the *input-output orientation* in estimating the cost efficiency. The input-output oriented model measures improve in efficiency through proportional reduction of input quantities without altering produced output quantities. Furthermore, this assumption is in accordance with the estimated technical efficiency for production frontier another issue needs to be addressed is the assumption of the Variable Return on Scale VRS.

The Constant Return on Scale is appropriate only when all DMUs (banks in our case) operate at an optimal scale. In the vast majority of cases, particularly the banking sector, this assumption is violated due to multiple reasons, such an imperfect competition, diverse regulations and restrictions,.etc. Coelli (1996) pointed out that the use of the CRS specification when not all firms are operating at the optimal scale, results in measures of technical efficiency (TE) that are confounded by *scale efficiencies* (SE) [18].

The use of the VRS specification permits the calculation of TE devoid of these SE effects. The Input-oriented model under the assumption of variable return to scale VRS is often termed as BCC (Banker, Chames and Cooper) model, which can be written in the following form (Coelli,1996) [19]:

Min θ_q^* subject to

$$\sum_{j=1}^{n} \lambda_j x_{t.j} \leq \theta^*_{q^{xiq}} \qquad i = 1,2,...m;$$

$$\sum_{j=1}^{n} \lambda_j y_{r.j} \geq y_{rq} \qquad r = 1,2,...s;$$

$$\sum_{j=1}^{n} \lambda_j = 1 \quad \lambda_j \geq 0 \qquad j = 1,2,...n;$$

4 RESULTS AND DISCUSSION

4.1 JORDAN

VRS: Variable return on Scale; CRS: Constant Return on Scale; DRS: Decreasing return on Scale; IRS: Increasing Return on scale.

Table 2. The overall Means (CRS-VRS-SCALE) of Jordan's Islamic and conventional banks

	Islamic	Conventional
Mean CRS	0,759	0,8278
Mean VRS	0,82033333	0,9255
Mean SCALE	0,91733333	0,8916

Source: calculated by the authors using DEAP 2.1 software

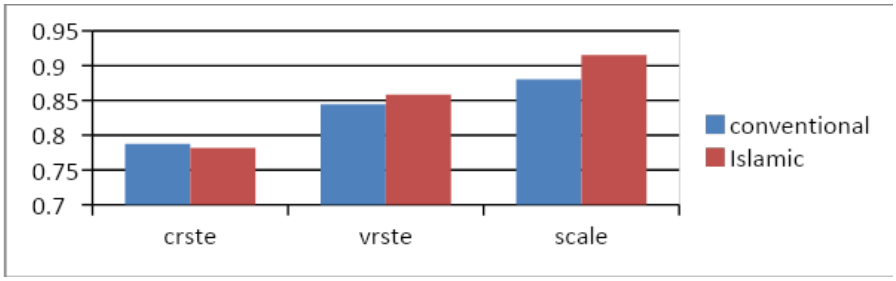

Fig. 2. The differences CRS and VRS and SCALE between CB and IB of Jordan

The table 2 shows the overall mean technical efficiency of Islamic banks and conventional banks separately. We notice that Jordan Conventional banks are more technical efficient that Islamic banks under both CRS and VRS assumptions (H2: accepted). For instance, the Islamic banks are 10% less efficient than conventional banks (VRS).

4.2 SAUDI ARABIA

Table 3. The overall Means (CRS-VRS-SCALE) of KSA Islamic and conventional banks

	Islamic	Conventional
Mean CRS	0,902	0,953875
Mean VRS	0,988	0,977
Mean SCALE	0,91325	0,9765

Source: calculated by the authors using DEAP 2.1 software

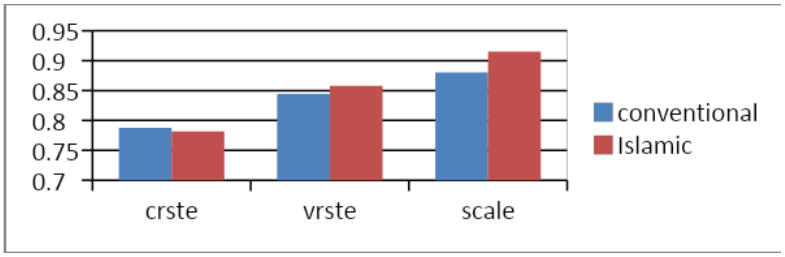

Fig. 3. The differences CRS and VRS and SCALE between CB and IB of KSA

The table 3 shows the overall mean technical efficiency of Islamic banks and conventional banks separately. We notice that KSA Conventional banks are more technical efficient than Islamic banks under CRS, and Islamic banks are more efficient under VRS assumptions (H2: not confirmed). For instance, the Islamic banks are 1.1% more efficient than conventional banks (VRS).

4.3 KUWAIT

Table 4. The overall Means (CRS-VRS-SCALE) of Kuwait's Islamic and conventional banks

	Islamic	Conventional
Mean CRS	0,6725	0,73
Mean VRS	0,9335	0,984
Mean SCALE	0,70116667	0,7408

Source: calculated by the authors using DEAP 2.1 software

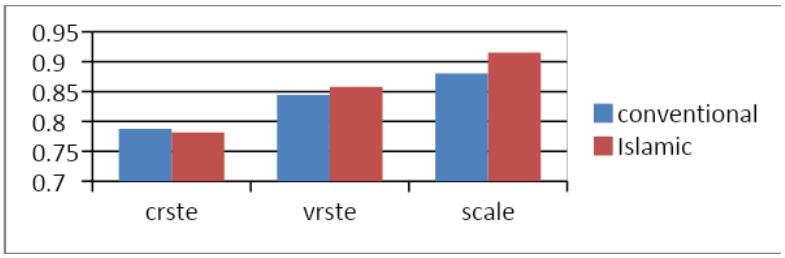

Fig. 4. The differences CRS and VRS and SCALE between CB and IB of Kuwait

The table 4 shows the overall mean technical efficiency of Islamic banks and conventional banks separately. We notice that Kuwait Conventional banks are more technical efficient that Islamic banks under both CRS and VRS assumptions (H2: Accepted). For instance, the Islamic banks are 10% less efficient than conventional banks (VRS).

4.4 QATAR

Table 5. The overall Means (CRS-VRS-SCALE) of Qatar's Islamic and conventional banks

	Islamic	Conventional
Mean CRS	0,638	0,61785714
Mean VRS	0,853	0,83157143
Mean SCALE	0,71933333	0,74528571

Source: calculated by the authors using DEAP 2.1 software

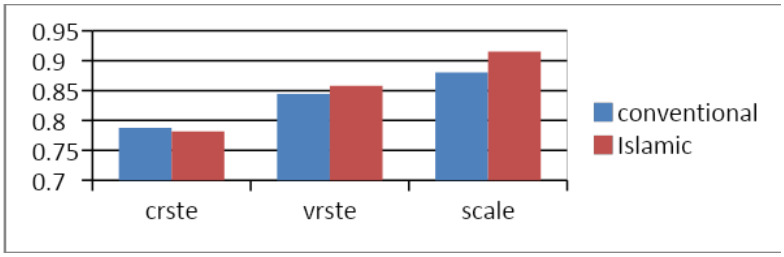

Fig. 5. The differences CRS and VRS and SCALE between CB and IB of Qatar

The table 5 shows the overall mean technical efficiency of Islamic banks and conventional banks separately. We notice that Qatar Islamic banks are more technical efficient than Conventional banks under both CRS and VRS assumptions (H2: rejected). For instance, the Islamic banks are 0.215% more efficient than conventional banks (VRS).

4.5 TUNISIA

Table 6. The overall Means (CRS-VRS-SCALE) of Tunisian's Islamic and conventional banks

	Islamic	Conventional
Mean CRS	0,717	0,82888889
Mean VRS	0,724	0,88366667
Mean SCALE	0,99	0,9411

Source: calculated by the authors using DEAP 2.1 software

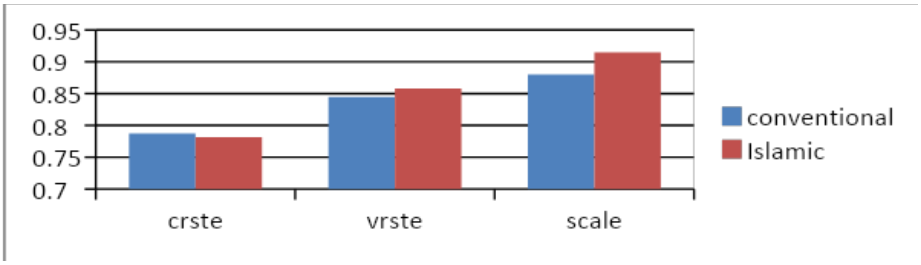

Fig. 6. The differences CRS and VRS and SCALE between CB and IB of Tunisia

The table 6 shows the overall mean technical efficiency of Islamic banks and conventional banks separately. We notice that Tunisian conventional banks are more technical efficient than Islamic banks under both CRS and VRS assumptions (H2: accepted). For instance, the Islamic banks are 0.159% less efficient than conventional banks (VRS).

4.6 ALGERIA

Table 7. The overall Means (CRS-VRS-SCALE) of Algerian's Islamic and conventional banks

	Islamic	Conventional
Mean CRS	0,845	0,8355
Mean VRS	0,8495	0,697
Mean SCALE	0,993	0,954375

Source: calculated by the authors using DEAP 2.1 software

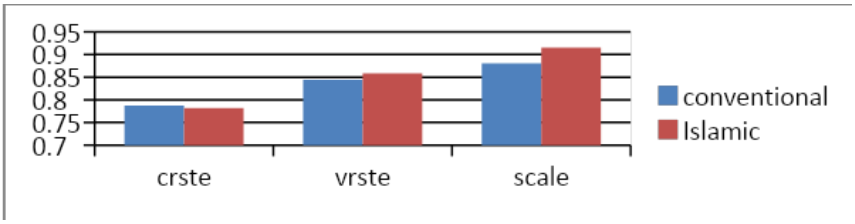

Fig. 7. The differences CRS and VRS and SCALE between CB and IB of Algeria

The table 7 shows the overall mean technical efficiency of Islamic banks and conventional banks separately. We notice that Algerian's Islamic banks are more technical efficient than conventional banks under both CRS and VRS assumptions (H2: rejected). For instance, the Islamic banks are 15.25% more efficient than conventional banks (VRS).

4.7 MIDDLE EAST

Table 8. The overall Means (CRS-VRS-SCALE) of Middle East's Islamic and conventional banks

	Islamic	Conventional
Mean CRS	0,742875	0,78238304
Mean VRS	0,89870833	0,92951786
Mean SCALE	0,81277083	0,83854643

Source: calculated by the authors using DEAP 2.1 software

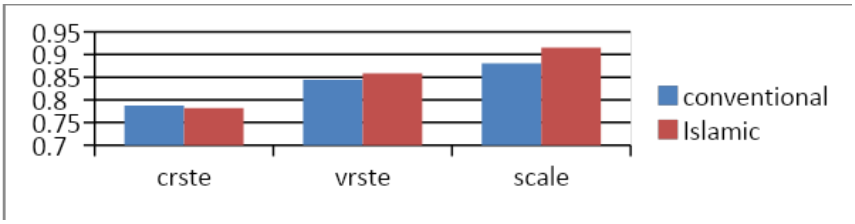

Fig. 8. The differences CRS and VRS and SCALE between CB and IB of Middle East

The table 8 shows overall mean technical efficiency of Islamic banks and conventional banks separately. We notice that Middle East's Conventional banks are more technical efficient than Islamic banks under both CRS and VRS assumptions (H2: accepted). For instance, the Conventional banks are 3.08% more efficient than Islamic banks (VRS).

4.8 NORTH AFRICA

Table 9. The overall Means (CRS-VRS-SCALE) of North Africa's Islamic and conventional banks

	Islamic	Conventional
Mean CRS	0,781	0,83219444
Mean VRS	0,78675	0,79033333
Mean SCALE	0,9915	0,9477375

Source: calculated by the authors using DEAP 2.1 software

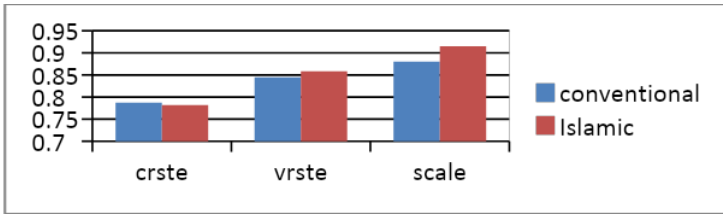

Fig. 9. The differences CRS and VRS and SCALE between CB and IB of North Africa

The table 9 shows the overall mean technical efficiency of Islamic banks and conventional banks separately. We notice that North Africa's Conventional banks are more technical efficient than Islamic banks under both CRS and VRS assumptions (H2: accepted). For instance, the Conventional banks are 0.4% more efficient than Islamic banks (VRS).

The table 8 and 9 show that both conventional and Islamic banks in North Africa are more technical efficient compared to its peers in Middle East (H1: rejected).

4.9 MENA REGION

Table 10. The overall Means (CRS-VRS-SCALE) of Mena's Islamic and conventional banks

	Islamic	Conventional
Mean CRS	0,7619375	0,80728874
Mean VRS	0,84452083	0,85813393
Mean SCALE	0,90213542	0,89314196

Source: calculated by the authors using DEAP 2.1 software

The table 10 shows the overall mean technical efficiency of Islamic banks and conventional banks separately. We notice that MENA's Conventional banks are more technical efficient than Islamic banks under both CRS and VRS assumptions (H2: accepted). For instance, the Conventional banks are 1.72% more efficient than Islamic banks (VRS).

5 CONCLUSION

In this empirical chapter we have investigated the efficiency of 66 banks in MENA region over 6 countries. This study found that the conventional banks are more technical efficient in both CRS and VRS than Islamic banks in Jordan and Kuwait and Qatar.

The findings also indicated that KSA Conventional banks are more technical efficient than Islamic banks under CRS, and Islamic banks are more efficient under VRS assumptions, the study about Algeria and Tunisia found that Islamic banks are more technical efficient under both CRS and VRS compared with conventional banks. These findings also observed in the case of the Middle East and North Africa regions separately.

Also both of conventional and Islamic banks in North Africa are more technical efficient compared to its peers in the Middle East. In the end we found that the conventional banks are more technical efficient than Islamic banking under both CRS and VRS in the whole MENA region.

GENERAL CONCLUSION

The purpose of this paper is to assess the technical efficiency of Islamic and conventional banks in a comparison perspective. We have focused in the theoretical background on explaining the fundamental principles of Islamic banking, the paper firstly introduces the understanding Islamic financial and banking, as it will be difficult to appreciate the resultant financial techniques without an understanding and appreciation of these principles.

From an empirical point of view, the aim of this paper has been to investigate the efficiency of 66 MENA banks (conventional and Islamic). We measured the technical efficiency and found out the score for each bank relative to its peers. The results suggest that there are differences among banks in their technical efficiency scores. The findings also suggest that the average scores of technical efficiency (CRS) and pure technical efficiency (VRS) for the banking sector in the MENA region as a whole are 78.46% and 89.76% respectively, and as a comparison between Islamic and conventional banks in MENA region, we found that the conventional banks are more efficient in both technical efficiency (CRS) and pure technical efficiency (VRS) than Islamic banks, So that the results were (80.72 % >76.19 %) in CRS and (85.99 % > 84.27 %) in VRS which provide relative answers to our research question.

RECOMMENDATION

- Bank's Management should take care about the improvement of the scale efficiency as well as pure technical efficiency and the potential improvements that come from the analysis results of this research in order to improve the efficiency the inefficient banks.
- It is recommended to apply the DEA analysis for economic sectors other than banks, such as insurance companies, it will give new insights about their indicators of efficiency and will help in the strategic planning.

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