Measuring The Efficiency of Islamic Banks: Criteria, Methods and Social Priorities*

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Abstract: With the rapid expansion in recent decades of Islamic financial institutions, banks in particular, assessments of their performance have also proliferated. This paper does two things. First, it takes stock of the criteria and methods used to measure the efficiency of Islamic banks, and of the results obtained. Second, it asks if the approaches chosen are commensurate with the objectives of Islamic banking.

Islamic economists appear to have used mainstream cost-profit considerations in assessing bank performance: ratio analyses and various sorts of input or output frontier models. Also, the way they use the techniques is often marred by gaps, errors, and inconsistencies that render their conclusions vulnerable even in their own framework.

This paper suggests that the performance of Islamic banks be evaluated, with reference to their social responsibilities in an Islamic framework. The fulfilment of cost-profit criteria may still be necessary but cannot be, for Islamic banks, a sufficiency condition as well. We may have to evolve goal-oriented efficiency criteria and basic changes in the organizational structure of the Islamic banking, before the system can meet the needed norms.

I. Introduction

There has been an unprecedented expansion in the financial sector of the economies of both developed and developing countries over the past fifty years or so.[1] Even Islamic banking, with a formal standing of no more than two decades, has had its share of expansion. At present it is claimed that about 261 banks in about 100 countries manage assets worth no less than $250 billion, growing at 10-15%

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per annum.[2] In Malaysia the Islamic institutions – exclusive plus mixed — are expected to capture, by the year 2010, market share worth 20% in terms of assets owned.

Islamic financing is at the same time becoming more diverse and venturesome. Its base has both deepened and widened. Islamic financial institutions include commercial, investment and offshore banks, insurance companies, and trust funds. They now finance trade, industry and agriculture, infrastructure projects, building construction and so on. They have pervaded many non-Muslim countries, operating alongside and in competition with conventional financial institutions. It is a confirmation of the profitability of interest-free financing that many conventional banks have chosen to open Islamic 'windows' or separate branches to take advantage of Islamic financial instruments.

However, this worldwide expansion of the financial sector, including the Islamic, has not been free of blemish or alarm. It has often been described as ushering in grave financial crises that devastated flourishing economies, especially in the developing world, during the 1980s and 1990s. All countries in transition from communism to free markets have faced at least one banking crisis, and many more than one. The causes of trouble were both internal and external. Countries embarked on financial reforms, restructuring the system with emphasis on enlarging the units through capital injections and mergers (some forced). Controversy has raged around the issues of optimal size and type of ownership for improved banking performance. Questions have been raised as to how good it was to let new banks enter the market, or sell domestic banks to foreigners, or whether the smaller banks had any future at all in the era of globalization and banking market consolidation.[3]

The issues prompted a spate of writings aimed at evaluating the performance of banks; the dominant part of the financial system. It was being increasingly asked: How efficient are the commercial banks in discharging their functions? The inquiry was important for the ordinary person, bank managers, financial analysts, and public policy makers alike. Efficient performance by the young Islamic banks was all the more important in order for them to compete with the mature conventional systems, especially in fund mobilization, and so increase their share of the market. Of late, a number of studies on the efficiency of Islamic banks have appeared, employing the usual criteria and methods.

One objective of the present work is to investigate the nature of these criteria and methods in general and see if their application to Islamic banking has been in order. Another, rather more important, aim is to ask whether the criteria and methods employed are commensurate with the requirements of an Islamic social order. We shall see that, though relevant, these criteria and methods are inappropriate when judged by this touchstone. The paper contains much of what is now stock-in-trade in conventional economics, but the discussion may enrich and add to the literature on its maturing Islamic counterpart.

Writings on efficiency measurement of banks normally provide a broad general sketch of the economy, its financial structure, number and size of banks, their sources and uses of funds and the like. The information helps the reader understand the objectives and methods used for the measurement of efficiency in the work, as also the policy conclusions that follow from it.[4] Efficiency studies in the area of Islamic banking do address this requirement, but the information they provide is often meagre and patchy.

The paper is divided into seven sections. In the next section, I explain the concept of efficiency and its variants as used in conventional economics, including banking. The concepts follow from the goals banks pursue, and mould the criteria for evaluating their performance. Section 3 examines a leading example of ratio analysis to evaluate the performance of Islamic banks. Section 4 presents the theoretical framework of econometric models used to measure the efficiency of production units, to prepare the reader for the subsequent appraisal of such models. Section 5 reviews briefly some of the applications of the benchmark models to Islamic banks. In Section 6, I examine the efficacy of the current efficiency criteria with reference to the social priorities of Islam. Section 7 offers some concluding observations.

II. Efficiency: Concepts and Criteria

In mainstream economics the primary objective of business including finance is the maximization of profit for its owners. Concepts of efficient performance are invariably geared to this norm. In principle, the ideal is possible to achieve (i) if a production unit (PU) produces maximum output with given inputs or (ii) obtains a given output

using minimum inputs, other things remaining unchanged. In (i) we use a production or output (*Y*) frontier to measure efficiency while in (ii) an input or cost (*C*) frontier is employed. The equations for determining efficiency scores, their numerical values, interpretations, and policy implications in the two approaches are quite different. As writers on Islamic economics have mostly looked at the issue from the cost angle, this discussion follows suit.

Farell (1957) is credited with being the first to indicate that productive or *economic efficiency* has two components. First is the purely physical or technical component that refers to the ability of a PU to produce as much output as given input usage allows, or by using as little input as output constraints permit. Thus, *technical efficiency* focuses on avoidance of waste; it essentially has an output augmentation orientation. Second is *allocative efficiency* or the price component: it refers to the ability of a PU to combine inputs and outputs in optimal proportions commensurate with their current prices (Lovell and Tatje, 1997).

The measure of technical efficiency is usually defined as the maximum reduction of all inputs that would allow continual production of the *same* output as before. Such input level is treated equal to unity and indicates technical efficiency because no further input reduction is feasible, and a score of less than unity by the same token indicates technical inefficiency measured by one minus the actual score of a PU. Figure 1 illustrates the basic concepts. Here the PU is producing a given output *Q* using an input combination defined by point, say A. The same level of output could have been produced by radically contracting the use of both labour and capital back to point B, that lies on the isoquant associated with the minimum level of inputs required to produce *Q* on the basis of available technology. The input oriented technical efficiency is defined as *TE = OB / OA*. However, it is point *D* where the marginal rate of technical substitution equals the input price ratio P_L / P_K that gives the least cost combination of inputs for producing *Q*. Notice that total cost at *C* and *D* is equal. To achieve the same level of cost, i.e. the expenditure on inputs, would need *A* to be contracted further to point *C*. Hence, the *cost* efficiency is to be defined as *OC / OA*.

Figure 1: Input-oriented Technical and Allocative Efficiency
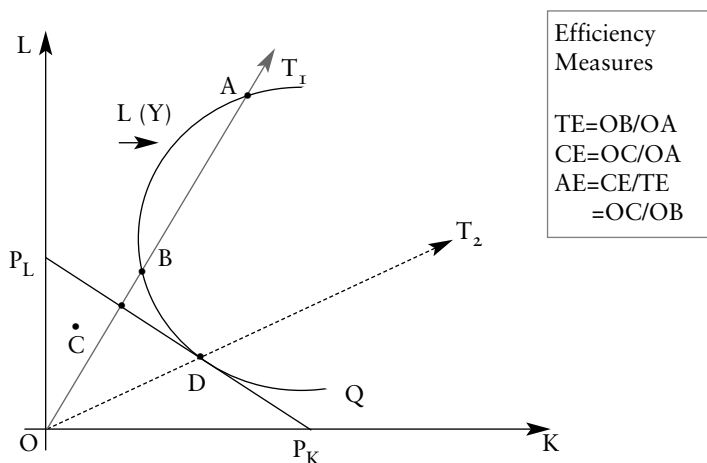
If we know the ratio of input prices i.e. the slope of the $P_L P_K$ isocost in Figure 1, we can get the allocative efficiency (AE) of a PU operating at *A* defined as *AE = OC / OB*. Now, if we take the product of efficient quantity and input price ratios, we can get a measure of overall or economic efficiency (*OE*) as under. Notice that *OE* equals cost efficiency *CE* and is the same as economic efficiency EE. The terms *EE*, *OE* and *CE* are interchangeably used in the literature under review. Thus,

$$EE = OE = (TE). (AE) = (OB/OA). (OC/OB) \qquad (1)$$
that reduces *OC/OA = CE*

As (a) *CE = OC / OA* is less than one, so (b) the gap *[1 − (OC / OA)]* measures overall cost inefficiency CIE.[5] This can vanish if technological improvement leads over time the PU to produce at point *D*, input prices remaining unchanged.

The above explanation of the conceptual framework for efficiency measurement is provided in terms of the cost criterion. Even though it implies profit maximization, a number of studies target profit directly as the focus of their attention. Both cost and profit criteria are used to study the impact on them of a host of identifiable factors ownership forms, scale of operations, nature of the economy, state of competition, business environment and the like via the efficiency route. The approaches may well differ in each case.

Interestingly, Islamic scholars consider the same conventional criteria appropriate for measuring the performance of Islamic banks and often find them more efficient than their mainstream counterparts. They have usually employed either of the two measures for the purpose: (i) the traditional ratio analysis and (ii) the more sophisticated Stochastic Frontier framework. Their conclusions require scrutiny as they appear to counter both popular perception and experience.

III. The Ratio Analysis

Munawar Iqbal

We may begin with the important work of Munawar Iqbal (2001): *Islamic and Conventional Banking in the 1990s: A Comparative Study* that uses the ratio method for the purpose. He presents a survey of the overall progress of Islamic banking, including its growth and performance over the decade in a comparative setting. We are concerned here mainly with the part that deals with the efficiency of Islamic banks vis-à-vis their mainstream competitors. Iqbal uses the relevant ratios of 1000 top conventional banks as the benchmark for purposes of comparison (p. 377). His conclusion is:

> When compared with the conventional banks, Islamic banks as a group out-performed the former in almost all areas and in almost all years [though] there are considerable variations among Islamic banks in terms of growth as well as performance (Entry 4, p. 388).

This is a categorical statement and calls for a hard look at the evidence it rests on. Prefacing the exercise with a brief mention of the method and content of Iqbal's work may perhaps be helpful. The work has two conspicuous features. First, it deals only in terms of ratios and percentages to compare various variables for 1000 conventional banks as against 12 from the Islamic sector. The aggregated magnitudes of variables in the former category may be millions of times more than those in the latter. The market share of the Islamic sample may be 'a drop in the ocean', for that reason alone, Iqbal may be seen to be comparing two very different sorts of oranges on the basis of their colour, not quality. That apart, if the author had based his ratios on the information compiled from the annual reports

of the banks (p. 360), it would have added force to the logic of his argument if absolute figures were also provided side by side with the ratios in his tables or in an appendix. In the absence of such information, the reliance on ratios *alone* to draw conclusions makes little sense: it may indeed be misleading. Table 1 below illustrates how mere ratios might be misleading if absolute values are not simultaneously provided.[6] Notice that in Malaysia the amount of outstanding property loans from banks rose in every year, while the *rate* of growth both rose and fell. Could one read the implications of the latter phenomenon correctly without knowing the continual rise in the absolute magnitude of the loans? Policy prescription might be different if magnitudes were unknown.

Table 1: Outstanding Residential Property Loan of Commercial Banks in Malaysia

As at end →	Dec 1996	Dec 1997	Dec 1998	Dec 1999	Dec 2000	Dec 2001	Dec 2002
Outstanding Loans	29.62	37.89	43.38	50.36	60.98	73.09	83.09
Growth Rate	–	27.92%	14.49%	16.09%	21.09	19.85	18.24%*

Source: Bank Negara Malaysia Monthly Bulletins.
Note: Figures in RM billion; *Annualized.

The second feature of the work is the use of a sample design that gave rise to some contradictions. Iqbal informs us that his sample of 12 Islamic banks accounts for more than 75 percent of the aggregate capital and assets of the private sector Islamic banks and for that reason, in his view, it constitutes a very large sample from a *statistical* viewpoint (p. 360). How the banks were selected and why is not explained. In any case, it is not what proportion of the aggregate values the sample banks together cover, but (n) the number of cases included that makes it large or small in *statistical* parlance. Thus, *n* being 12 in the present case, the sample in the technical sense remains small. Further, accounting practices, banking laws, and managerial discretions make the same variable in the sample banks different in content and import within and between nations. One does not know if and how the author edited the data to achieve uniformity for aggregation, especially in the case of cost and profit values, which are

the key variables for a comparative evaluation. Salama (2003) in his comments has also raised some pertinent questions concerning the issue.[7]

The above noted blemishes have led to many *faux pas* in the argument. For example, Iqbal finds the overall cost/income ratio for Islamic banks as 55.9% during 1990-1994, falling further to 53.4% in 1994-1998. These ratios were much lower than the benchmark fixed at 65% for the top 1000 conventional banks, leading to the claim of overall better performance by the Islamic banks. But the very next moment, the author dilutes his conclusion by revealing that the weighted average was pushed below the benchmark due to the ratio of the largest bank in the sample being too low for special reasons (p. 378).[8] He turns to the simple averages of the ratios for the sample, and finding them higher than the benchmark in both the periods, *reverses* his claim quoted earlier to "conclude that in general Islamic banks are not working in a cost effective manner" (p. 378).

Finally, it may be noted that ratio analysis as a measure of bank efficiency has some serious limitations. The reliance on benchmark ratios is, for example, a ticklish issue. Fixing the benchmark could be arbitrary and misleading, as we find it in Iqbal. Also, ratios fail to capture the long-run dynamics of business; they aggregate many aspects of performance relating to operations, marketing, and finance at the expense of vital details. The conclusions drawn on their basis are invariably taken with a grain of salt.

IV. Econometric Models: Theoretical Framework

In recent years ratio analysis has been fast losing ground to the frontier analysis techniques for measuring the efficiency of financial institutions.[9] The vast majority of their application has focused on the cost effects of scale and scope economies. Nevertheless, despite the growing volume of research in the area, there is still no consensus on the best method for measuring the efficiency of financial institutions. Of the various approaches so far employed, the most widely used are the econometric or Stochastic Frontier Approach (SFA) models and the non-parametric linear programming or the Data Envelopment Analyses (DEA).

The relative merits and limitations of these approaches have often been discussed in the literature. Put briefly, one often-mentioned disadvantage of SFA models is that they impose a function form and distribution assumptions on the data prior to estimation.[10] In contrast, DEA does not require any assumptions about the functional form, and is, therefore, less open to misspecification. Also, DEA is non-parametric; it does not take into account random errors. As such, there is no problem in subsequently assuming an underlying distribution form for the error term. However, for this very ability to avoid statistical noise, the efficiency estimates the approach provides could well be biased, if the production process is largely characterized by stochastic elements.

The SFA and DEA techniques are mostly used in two stages. First, each seeks to estimate efficiency or inefficiency scores relevant to the objectives of the study. These scores can be used to place the PUs on the efficiency ladder to indicate their relative performance.[11] In the second stage, an attempt is made to search for the nature and extent of causal relationship between inefficiency estimates and other relevant variables such as size of the firms, their location, taxation, public expenditure, stability, investment, profits, stock prices, and so on. Use is made of logarithmic conversion of data that straightens the selected production function. The application can focus on individual entities e.g. firms or farms or their aggregation. The frontier approach is a tool that can be used in *any* field of inquiry where variables can be subjected to measurement.

Using the SFA for estimating cost efficiency requires the specification of a function form. The translog cost frontier is often considered appropriate for studying efficiency issues in the banking sector. It is a very general and flexible function form and encompasses some other approaches also like the Cobb-Douglas. SFA looks at the question of efficiency in terms of cost minimization for given outputs, rather than maximization of output from given inputs.

SFA models vary according to the type of data used for the study i.e. cross-sectional or panel, and are oriented to inputs or to output. Studies on efficiency of Islamic banks we shall be evaluating use cross-sectional input oriented data i.e. they seek resource conserving cost minimization, given the output to be produced. Early cost oriented efficiency studies typically included more than one output and jointly

estimated the function with the associated input share equations, derived using the Shephard's Lemma.[12] But the difficulty is that their derivation implies that the PUs are using their long run efficient input mix, i.e. the firms are assumed allocatively efficient. Hence, most studies now estimate a single cost function. This is possible because many PUs, in fact, produce a single output, and others can aggregate their multiple outputs into a single output index (Kebede, 2001: 13).

In a simple single output and multiple inputs case, we estimate the frontier using the functional relationships:

$$C_{it}=f\,(y_{it},\,w_{kt}) + \varepsilon_{it} \tag{2}$$

where $\varepsilon_{it} = v_{it}+u_{it}$

In (2) C_{it} is the total cost of PU_i in a period t, y_{it} and w_{kt} are vectors of output and input prices respectively $f\,(y_{it}\,;w_{kt})$ provides the cost frontier. The random disturbance term ε_{it} allows the function to vary stochastically. It has two components: the $v_{it}s$ are independently and identically distributed (*iid*) elements; they are truly uncorrelated with the regression. In contrast, the $u_{it}s$ are non-negative variations associated with the technical inefficiency of the PU_i. Thus, the error term *e* is not symmetric as $u_{it} \geq 0$.[13]

Figure 2: Results Need not be Identical
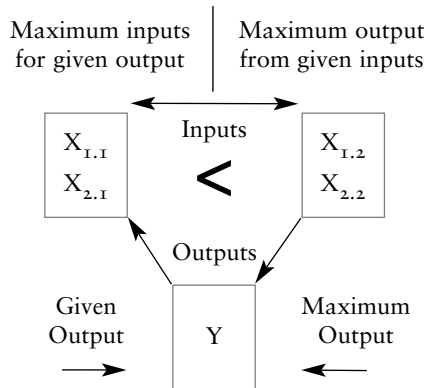
Estimating the PU-specific inefficiency is the ultimate objective of the model. This requires the extraction of separate estimates for v_i and

u_i from the values of ε_i for each PU. For this we need distributional assumptions on the two error components additional to those underpinning the OLS, and also a different estimation technique to obtain a consistent estimator of (the intercept and) the TE for each PU. The required distributional assumptions are: v_i's are normally distributed, u_i's follow non-negative half-normal. Both v_i and u_i are distributed independently of each other and of the regression (Kebede, 2001: 15–17). To recapitulate, the production oriented approach to the measurement of efficiency aims at the maximization of output (y) from the given inputs. But in the input oriented approach the objective is minimization of cost, given the output. The two approaches, if applied to the same case, would yield different results. This is equally true of inefficiency measures. In any case, the cost efficiency of a PU_i is defined as [*exp (-u_i)*]. But as u_i cannot really be observed, it is estimated by using the conditional *E-[exp (- $u_i | \varepsilon_i$)]* as the best predictor of u_{it} at time *t*. Curtiss (2000: 11) provides the derivation procedure as under:

$$\mathrm{E}[\exp(-u_i | \varepsilon_i)] = \frac{1 - \phi(\sigma_A + \gamma\varepsilon_i / \sigma_A)}{1 - \phi\gamma\varepsilon_i / \sigma_A} \exp\ (\gamma\varepsilon_i + \vec{w}_A / 2) \qquad (3)$$

where

$$\gamma = \sigma_\mu^2 / (\sigma_u^2 + \sigma_v^2)\ ; \ \ \sigma_A = \sqrt{\gamma(1-\gamma)\sigma_s^2};\ \ \varepsilon_i\,(y_i - x_i\beta)$$

$\phi(.)$ is the density function of a standard normal random variable. In an input oriented cost model, efficiency is measured at time t in the usual manner as the ratio of minimum cost to observed cost:

$$CE_i = \frac{f(y_i, w_k)\exp(v_i + u_{\min})}{f(y_i + w_k)\exp(v_i + u_i)} = \exp\ (u_{\min} - u_i) \qquad (4)$$

It follows that in an output-oriented approach, i.e. where the objective is to maximize production, *exp(-u_i)* is maximized for the given inputs, but for measuring cost efficiency it has to be *minimized*. Jemric and Vujcic (2002: 5 – 7) make this point at once explicit.

The easier way to find the maximum or minimum value of *exp(-u$_i$)* is to use the maximization likelihood method (MLM), which is automated in several computer programmes. The general problem is often solved by the minimization of *[–log(L)]* where *L* is the likelihood function.[14]

V. Efficiency Models and Islamic Banks

The foregoing discussion may help understand the structure, achievements, and limitations of the efficiency studies that seem to multiply apace in the area of Islamic banking as elsewhere. We shall restrict the appraisal to include the works of Majid *et al.* (2003), Saaid *et al.* (2003), and the article of Darrat *et al.* (2002), the only to use the DEA approach. These are seminal works and deserve credit for introducing Islamic economics to some new methods of analysis, that appeared rather late even in mainstream applied economics. The techniques used are quite sophisticated and these writings do not seem to have received from the readers the attention they deserved.

However, being among the first of their sort in Islamic banking, and that too in an area where more haze than light still prevails even in mainstream economics, these efforts could not have been entirely free of weaknesses. A few general remarks may not be out of place though they do not necessarily apply to all these writings uniformly.

A common feature of these writings, as alluded to earlier, is the insufficiency of background information they provide about the nature of the economy, and the state of its monetary and fiscal policies affecting the financial sector. Even discussion on the structure, growth and place of Islamic banking in the overall financial set-up of the country leaves much to be desired, especially in the first two works. A number of more recent writings exemplify the point.[15]

Another difficulty with these exercises is that they do not provide clear explanations of the sources, nature, limitations and editing of the data they use. The definitions with reference to the content, at times even the number, of outputs and inputs adopted for the study remain unclear. We shall return to this point later. Appropriate, and unambiguous, explanations of method used are lacking; at some points yawning gaps greet the reader. Reasons supporting the conclusions arrived at are often missing, their policy implications seldom adequately stated.

Majid et al.

Majid *et al.* (2003) measure the cost efficiency of 34 commercial banks in Malaysia, panelling the data for the period 1993-2000 with a view to comparing the relative performance of two bank sets – Islamic and mainstream.[16] On the basis of their results, they claim that "the efficiency of Islamic banks is not statistically different from the conventional banks". Also, they find "no evidence to suggest that bank efficiency is a function of ownership status, i.e. public or private, foreign or local" (p.1). These conclusions are important, and need closer examination.

The authors employ the familiar translog cost frontier function for ascertaining the efficiency scores for the selected banks individually, as well as for different bank groupings. Their model specification and its details are mostly in order. Still, a few comments may be appropriate. To begin with, the study covers a fairly long period – 1993 to 2000 – but the results have no time dimension: obviously the authors have used panel modelling for their work. Since the total number of banks they cover (34) is quite large, one wonders if the post 1997-1998 crisis data, with greater homogeneity and handling ease, would not have served the purpose better. Or the data could have been used for a dynamic study of inefficiency i.e. changes in it over time.

Again, only two Islamic banks appear in the sample and the results do not highlight their comparison with mainstream banks as planned. This makes the title of the paper a bit misleading. Also, what about the Islamic windows operating in the mainstream banks? How have the authors dealt with the impact of this phenomenon on the efficiency of banking in the country, Islamic or otherwise? This is a difficult question, yet those measuring efficiency of banks in Malaysia can hardly afford to bypass it.[17] One is expected to at least discuss it as a limitation of the study.

The data set for 34 banks – 24 local and 10 foreign – for the paper, is created using the banks' annual reports and the ABM Bankers Directory, to fill gaps in information on the number of employees in some cases. The banks have been categorized as local and foreign, Islamic and conventional, private and public, and as large and small (p.10) to study the impact, if any, of ownership forms, interest-free financing, and scale, on bank efficiency in the country. Of

course the categories overlap. Had the authors provided the edited data file as an appendix to their work, one could better appreciate their contribution, and future researchers might have benefited more.

Also, the paper does not reveal the component details of the outputs or inputs selected for modelling. One finds a general sort of discussion on the issue on page 9 of the paper. It is hinted that total cost (C) includes all labour and capital expenses plus interest. In the case of Islamic banks, interest is replaced with income distributed to the depositors. What is included in labour expense or how capital expense is estimated is not clear. The authors refer to a paper of Al-Habshi (1999) for details. The paper is not readily available and, in any case, does not contain the needed explanations. Ideally, the explanation of this crucial point in the paper needed to have been full and complete. The authors mention three outputs: loans, advances, and financing, but provide few details on their nature, content or inter-bank differences. 'Financing' in particular is a dubious category unless clearly explained.

The corresponding input prices include (i) staff expenses per employee, (ii) expenses on land, building and equipment per Ringgit of assets, and (iii) expenses on interest or income distributed per Ringgit of deposits. Here also, the paper has no explanatory discussion. For example, in (i) for averaging expenses of labour, all employees cannot be treated on the same footing; the proportion of officials to clerks is not the same in all banks. In foreign banks it is found loaded generally in favour of the officials as opposed to clerks. Also, foreign banks earn a significantly larger share of their revenue from non-interest sources, through activities like derivatives trading, consumer credit, and merchant banking. Such matters are not given weight in the condensed data the work uses. Likewise, in (ii) historical and current costs differences, between items and banks, may have considerably distorted the aggregation.

Finally, in their use of the translog cost frontier model Majid *et al.* did not explain, crucial though it was, the way they used the maximum likelihood method MLM for obtaining $E[exp\ (-u_i \big/ \varepsilon_i)]$.[18]

Saaid et al.

The paper of Saaid *et al.* deals with the performance of banks in Sudan. They assign to the country the distinction of initiating a total

transformation of its financial system, to observe Islamic injunctions in the conducting of business after the year 1989. This has put, as the authors say, the spotlight on the performance of Islamic banks in Sudan, and lends significance to their effort. The study employs the SFA cost frontier approach, decomposing the error term ε into random noise v and possible inefficiency factor u. The model specifications are almost flawless.[19]

The paper finds that the Islamic banks in Sudan have low *X*-efficiency – technical and allocative – they were not optimizing their input usage. Furthermore, the authors claim that inefficiency is more in resource allocation than in their technical use. Based on these broad findings, the study ventures a few policy prescriptions for improving the performance of Islamic banks in Sudan. This sketch hopefully does justice to their work.

Figure 3: Output-Oriented Technical and Allocative Efficiency
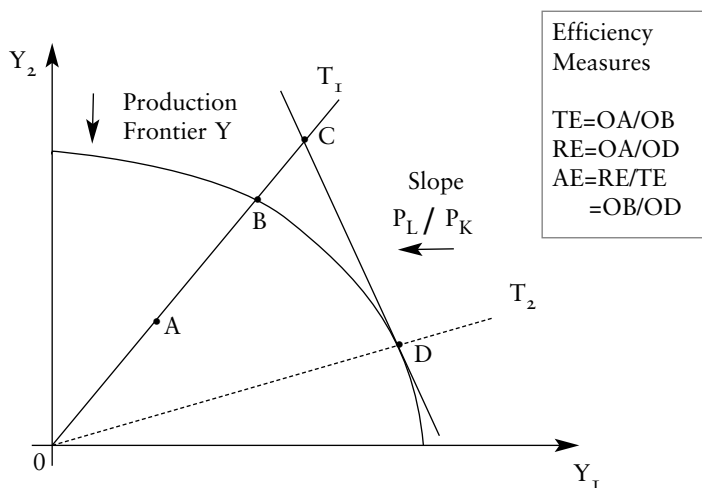
The effort of the authors is laudable as far as it goes. The difficulty is that it does not go far enough, nor always stay on course. It could have been prefaced with the details, even if brief, of the evolution, expansion, transformation, and ownership or scale structures of Islamic banks in Sudan. Is it that no foreign banks operate in the country or interest-based financing is at zero level

there? The input-output numbers, let alone their composition details, are unclear. The section on data and variable specifications, for the most part talks of what the mainstream writings on the subject contain; what the study is based on is scantily mentioned. The section is overloaded with methodological explanations, though these too are not devoid of gaps.

Take, for example, the estimation of $E[exp\ (-\ u_i\ |\varepsilon_i)]$. The authors set up where $-\varepsilon_i = \Sigma^\Lambda \varepsilon_i$ "is the residual obtained from equation 1" (p. 130). Their equation 1 is:

$$ln\ TC_i = f\ (y_i\ ,\ w_i) + \varepsilon_i$$

But the sum of residuals ε_i from this equation must always equal zero! That makes the formulation intriguing. Again, the authors "define $\hat{\xi}_i = max_{\hat{\xi}_i} - \varepsilon_i$ where the maximum is introduced in order to provide values of $\hat{\xi}$" (p. 130). The statement needs elaboration: why is max used in the equation not min, as the foregoing discussion suggests? Maximization is required when efficiency measurement is output oriented. A comparison of Figure 3 with Figure 1 would make the difference of the two approaches clear.

Shortfall of the estimated efficiency scores from one – the frontier – is not exceptional but mostly expected. The central elements of frontier analysis, to reiterate, consist of (i) the ranking of PUs on the efficiency scale to compare their relative performance, and (ii) to test the hypotheses that claim a causal relationship between efficiency and its perceived determinants. The work of Saaid *et al.* is distinct from others under review in that it falls in neither of the categories. Therefore, it is uncertain what significance one can attach to their conclusion: "The study as a whole shows 78 percent overall efficiency (*OE*), meaning that 28 percent[20] of the Sudanese Islamic banks' total cost was inefficiently used compared to (if) the banks were on the frontier (p. 137)". But could not the Sudanese Islamic banks still be found to be more efficient in comparison with those in other countries? Again, the claim that the technical component is the main source of overall inefficiency seems to conflict with the suggestion that public policy forced the banks to divert more of finance to the less productive agricultural sector of the economy (p. 137).[21] If that were true, the *allocative* component, not the technical, should have been the main culprit in lowering the overall efficiency scores, which the results show is not the case. Thus, question marks could be put on the

reliability of the model results and the policy prescriptions that are based on them.

Finally, Saaid *et al.* refer to the two alternative methods for estimating the overall cost efficiency of banks: (i) by averaging of the ξ, or (ii) by the deviation of the cost ratio of a bank from the stochastic frontier. However, (ii) provides a measure of inefficiency (*1- OE*), not of *OE*. Thus, the statement is inconsistent with their equation (4): $OE = C / C^* = \varepsilon^{-bt}$ where *OE* denotes overall efficiency, *C* is the observable cost, *C** is the estimated cost (p. 130).[22] Also, the authors do not clarify if the results the two alternative methods yield would be the same results. Nor do they say what methods they have used to obtain their own results. Thus, much confusion characterizes their treatment of the issues.

However, despite its blemishes, Saaid *et al.* have produced a work that we believe can, with appropriate modifications, be a helpful contribution in an important area of Islamic banking.

Darrat et al.

This work focuses on assessing the cost and technical efficiency of eight of the nine banks in Kuwait – all owned fully by the locals – in view of the increasingly competitive environment in the financing industry the world over but especially in the developing countries. The study covers a period of four years from 1994 to 1997. It does not resort to data panelling and produces separate results for each of the years. It uses the non-parametric DEA (variable returns)[23] model that has the advantage, among others, of allowing the *direct* calculation of allocative efficiency. The Mamquist measure of bank efficiency is employed to supplement the DEA.

Generally speaking, the product of the input output numbers in a DEA application should optimally be less than the sample size for effectively discriminating among the banks. The authors, therefore, employ three inputs (labour, capital, and deposits) and two outputs (loans and investments). For measuring cost efficiency, the analysis also incorporates the unit prices of inputs. The contents of each item and the method of its calculation are made explicit. Unlike many other writings, Table 1 of the paper presents the complete data file. The analysis it presents is both static and dynamic: the paper provides the efficiency scores of individual banks for each year of study and

also measures the impact of technical change over time. The main conclusions derived from the exercise are:

1. The most striking conclusion from the ranking Table 2 is that the smallest bank in Kuwait is consistently the most efficient of all banks in the country.

2. Going through their Table 3, that provides efficiency scores over the estimation period, one finds an unmistakable upward trend in the cost efficiency of banks, probably because of decreasing cost of funds.

3. As opposed to what Saaid *et al.* claimed for Sudan, the technical inefficiency of banks in Kuwait is consistently lower than their allocative inefficiency over the estimation period, suggesting that the main source of cost inefficiencies is presumably regulatory not managerial in nature: Kuwaiti banks do a better job in utilizing available inputs than in choosing the proper input mix.

4. Scale efficiency is also consistently higher than pure technical efficiency in Kuwaiti banks over the period of study.

5. Finally, Kuwaiti banks seem to have improved in terms of all types of efficiency over the period save 1996.

The work of Darrat *et al.* is short but well organized and adequately documented. Their explanations are clear, their conclusions fruitful. The various appendices are an integral part of their argument: they are enlightening and above all lend transparency to their work. However, there are limitations as well. For a work presented in 2002, the period of study 1994-1997 looks too far back into the past; their conclusions are at best monumental. Finally, the work lacks an Islamic dimension, or should one assume that there are no banks in Kuwait run on an interest-free basis?

VI. Efficiency Criteria and Social Priorities

It would be naïve to dispute the relevance of cost efficiency for Islamic banks, but we shall argue that it need not be the only parameter for assessing their performance. In mainstream economics, where in principle the promotion of private (individual) self-interest is considered primal for enhancing social well-being, efficiency criteria for PUs, including banks, had to remain focused on profit, the reason

for their being in business. For Islamic banks too profit adequacy is a survival requirement.[24] But if we look at the bigger picture a more basic question that stares us in the face is: can a business performance appraisal be independent of the broader priorities of a social organism? Past history and current practice both answer in the negative.

Mainstream economics primarily does not look beyond the cost profit criteria in evaluating the efficiency of a productive unit, simply because private enterprise operating through the market is the *raison d'être* of a capitalist society. While Islam does accommodate many features of capitalism, it aims at establishing a quite distinct social order.

All societal institutions including banks must help in the building of that order and must respond to its demands. The requirement is not only the formal abolition of interest but, more importantly, the eradication of the ulterior motives that prompt the seeking of an Islamic cover for interest.[25] Social organization in Islam is inspired by the central notion of *amānah,* the focus on fulfilling the basic needs of human beings, promoting mutual help and cooperation. It makes the seeking of professional skills and enterprise a *farḍ kifāyah*, and commands justice in all facets of human relationships, especially in the distribution of wealth and income.

The performance of Islamic banks must be judged primarily with reference to the extent they help in building this sort of society. Once they pass and stay above the break-even points, profit can be, in a measure, traded for promoting Islamic norms. We need not judge the Islamic banks' performance entirely on the mainstream criteria or compare them with conventional units on their basics. The social objectives of business in Islam moderate worldly temptations; people are required to overcome the relentless pursuit of profit in business.

Islamic financial institutions have mostly been designed on the pattern of commercial banks in terms of their outlook, objectives, procedures, training and *modus operandi.* But they are expected to undertake project financing, long-term risky ventures, and address the social aspirations for economic development. They hardly have the structure, aptitude, environment, or personnel to do what we think they must to do. And discussion on the crucial structural issues is rare in the literature. Rather, one comes across explanation, even

justification, for the overwhelming use of deferred contracts in Islamic banking, risk aversion is commonly mentioned, and of late profit rates and dividend policies have appeared among the efficiency criteria for Islamic banks. In fact, the two are listed among the reasons for Islamic banks concentrating on short or medium term finance (Hassan, 2003). But presumably the reverse causation is more valid. The blame for concentration lies on the organizational design these banks were allowed to assume (Hasan, 2003).

Opening Islamic *windows* in western-style commercial banks causes an apparent mismatch between the capabilities provided to them, and what they are expected to achieve. Mainstream commercial banks cannot be barred from entering the field for valid reasons but, as I suggested elsewhere (Hasan, 2003), it would better that they establish *exclusive* branches with pre-stated objectives. It is indeed gratifying to note that Bank Negara Malaysia is now on that course. Though the country's banking law is yet to be suitably amended, the Central Bank is now granting permission for Islamic financing only if the interested mainstream banks open separate Islamic branches or subsidiaries. This process has already started – two banks have recently been granted such permission.

Islamic banking, in the true sense of the term, can rarely meet the vital *Sharīʿah* objectives of raising a strong and prosperous Muslim *ummah* unless there is a complete break from tradition with reference to goals, sources and uses of funds, and operation methods. Planning authorities of a country, rather than its central bank, must prepare a comprehensive plan for the purpose. Once the development is redirected along appropriate lines, one can hope that PLS schemes and deferred contracts will appropriately supplement one another with a balanced growth and efficient performance of the Islamic financial system.

Finally, Islamic finance, though important, is only a street under construction in a much bigger Islamic road map. Its ultimate shape, carrying capacity, and usefulness will depend on what happens to the bigger picture. Crucial for success in the matter are social conditioning and political will; things will then more easily fall into their proper places.

VII. Concluding Remarks

We had mainly two objectives in examining some of the major recent writings on the efficiency measurement of Islamic banks. First, we aimed at highlighting the current criteria and measures used for the purpose. A related goal in this context was to examine if the applications were in order. Second, and more importantly, we wanted to judge the efficacy of the current criteria and measures with reference to the social objectives and priorities of an Islamic order and the role banks are expected to play in their achievement. We find that there have been some welcome contributions in the area of measuring the efficiency of Islamic banks, albeit not always free of blemishes.

To begin with, it is gratifying to note that Islamic economists have been quick to realize the importance of performance assessment in the fast expanding sector of interest-free finance, and shown a willingness for the usage of current techniques available for the purpose. However, their efforts are wanting on two fronts. First, even if one need not dispute the need of looking at the cost profit equation for efficiency appraisal of the Islamic banks, the application of the methods leaves much to be desired. Ratio analysis is a relatively older and easier technique of analysis. There are, however, pitfalls along the way of using ratios and percentages without taking into account supplementary information, especially if the data were significantly different or are very heterogeneous.

The parametric models were generally appropriate. But conceptual clarity, and more background information in some cases could perhaps have provided more convincing and fruitful results. The cost-oriented and output-oriented approaches are to be kept distinct; consistency in their use is vital; a mix up may create difficulties. The difficulty, even at the higher levels of scholarship, is that instead of theory leading empirical work, empirical research is mostly leading theory. The results are often confirmatory, for the simple reason that confirmation of a proposition is much easier than its refutation.

The greater lament, however, is that the mainstream criteria, methods and procedures were applied without attention to the purposes of establishing Islamic banks and their social responsibilities in an Islamic order. To enable these banks to fulfil their societal

priorities their organizational structure needs a major shake up. Greater transparency in transactions, encouragement to participatory financing, opening up of more specialized banks and customer services, increasing indulgence in long run finance, promotion of cooperative organizations are some of the suggestions to revamp, and reorganize Islamic finance. Things are moving, albeit late, in that direction (Hasan, 2003: 15-16).

NOTES

1. The financial sector is becoming progressively divorced from the real economy. Today foreign exchange spot transactions alone are worth more than 70 times the total volume of international commodity trade (Hasan 2003: 53).

2. See Beng (2004: 1). Such figures are often quoted in writings on Islamic finance and usually vary, the writers never indicating their sources. In view of this infirmity in reporting the figures, we join Rahman (2003: 232) in demanding research to get real data from authentic sources, the instruments these funds are invested in, their destinations, as also the motivation for collecting them. Proper documentation is needed.

3. The interest in different outcomes has grown with the magnitude of resources involved and the increasing national emphasis on microeconomic reforms, especially in the developing economies due to the onward march of global competition.

4. See Sathye (2001, Section 2, pp. 3-6) for a good example of incorporating relevant background information for such studies and how it helps a clearer understanding of his argument.

5. Definitions (a) and (b) put *CE* and *CIE* in a logical relationship: $CE + CEI = 1$. However, in the literature *CIE* has come to be conceived as a ratio of *CE* i.e. $CIE = (1 - CE) / CE$. Alternatively, we may state the relationship as: $CE = 1 / (1 + CIE)$. In some cases, the use of (*b*) may help avoid inconsistencies that insistence on using (*c*) may lead to.

6. Interestingly, Bisha (2004), in one of the more recent studies using ratio analysis, refutes convincingly the thesis that Islamic banks in Malaysia are more cost efficient than the mainstream banks. He bases his argument on extensive data provided in numerous appendices to his work. Another good example of providing data with ratios is the work of Eliraika (1998).

7. For example, he asks: How was the cost income ratio derived? What is included in costs? What is the definition of income used, is it the total revenue or total profit or what? Why is 65 percent the benchmark, and what are the implications if the percentage is achieved or if there were deviations? (Entry 6, p. 392)

8. But Figures 17.7 and 17.10 of the paper tell a different story: it is not the smallest but the tallest bar in each case that must have carried greater weight. Anyway, later the use of simple averages of the ratios in such a heterogeneous data, as the Figures depict, is but grossly inappropriate.

9. Berger and Hemphrey (1997) survey 130 studies that apply frontier efficiency analyses to financial institutions across 21 countries. The majority of these

studies were confined to the US financial sector. There, the large number of banks has traditionally facilitated econometric modelling (Avkiran 1999). Of late, the literature on efficiency issues is also growing apace in developing economies, especially those in transition to free markets.

10. Usually the conditions of linear homogeneity and symmetry are imposed on the data prior to estimation exercise implying constant returns to scale. See, for example Saaid *et al.*, (2003), n. 11.

11. Interestingly, Majid *et al.* (2003: 405) did promise to provide the ranking of 34 banks, included in their sample on this basis, but their paper eventually provided no such ordering.

12. See Saaid *et al.* (2003): They use the technique to extract share equations for capital and deposits (pp. 131, 134), but it is unclear why they dropped the one for labour prior to estimation (n.11, p. 139).

13. If u_i were equal to zero in fact or by assumption, SFA would be reduced to central tendency analysis.

14. For details see Bock (1998, pp. 1 – 5). Information on relevant software is available in Herrero and Pascoe (2002).

15. Sathye (2003), Jemric and Vujcic (2002), and Leong *et al.* (2002) provide good illustrations of the point.

16. For detailed comments on this paper see Hasan (2003).

17. It is a difficult question because the mainstream banks do not maintain separate full cost statements for the Islamic windows, e.g. their share in the overheads is not available to researchers. Maybe, it is because this significant component is missing or underestimated that the authors reached the pleasing conclusions that they did.

18. What the authors present in Table 2 of their work looks like regression coefficient. How and why they used MLM for their determination is not explicit.

19. For clarity, the symmetry and linear homogeneity conditions would have been better stated separately in n. 8, p. 139. Some of the parameters in Table 2, p. 134 do not seem to satisfy the specified conditions.

20. It may be indicated that the SFA does not provide the allocative efficiency estimates AEi; the same are estimated through division of the *CEi (= OEi)* by the corresponding TEi. As such, the authors could well have kept the inefficiency scores shown in their Table 4, p. 135 as *(1 – CE)*; alternatively, they could have clarified that discrepancy arises due to the relationship between efficiency CE and inefficiency *CIE*. (See n. 5 above.)

21. The authors could easily have tested the validity of their claim, regarding the adverse efficiency effect of forced diversion of finance to agriculture, using a fixed effects model.

22. The equation could be valid for an output oriented formulation where $C^* > C$. But in the cost-oriented approach that Saaid *et al.* have taken, we find $OE=C^*/C$ (see Kebede, p. 13). For, as $C > C^*$, OE remains ≤ 1. Compare the authors' formulation with those in our Figures 1 and 3; see also equation 4.3.

23. The authors impose on their model the restriction $\Sigma\lambda_j=1$.

24. Some studies target profit as the efficiency measure. For example, Hassan and Bashir (2003) use the criterion for an *aggregative* analysis. It must be indicated that profitability "can be characterized as a performance indicator of *single unit*

and it is calculated without the need for benchmark, whereas efficiency is based on relativity and can only be calculated with respect to a reference point" (Stavarek, 2003, *emphasis added*). Again, cost or output approach to efficiency measurement implies profit criterion. For example, Table 2 in Fat and Hua (1998) provides both the X-efficiency and profit efficiency scores for each of the six Singaporean banks from 1992-1996. Using the information as panel data we find that PE is an increasing function at a decreasing rate of CE with adjusted R2 = 0.82, with relevant coefficients significant at 5%.

25. For details on the point see Hasan (2003).

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