Comparing the Efficiency of Islamic Banks in Malaysia and Indonesia

Ascarya and Diana Yumanita

Center for Central Banking Education and Studies, Bank Indonesia

Jl. M.H. Thamrin 2, Radius Prawiro Tower, 18th fl., Jakarta 10110, Indonesia
ascarya@bi.go.id; diana_yumanita@bi.go.id

ABSTRACT

This study will measure and compare the efficiency of Islamic banks in Malaysia and Indonesia using Data Envelopment Analysis (DEA), which is a non-parametric and deterministic methodology for determining the relative efficiency. Intermediation approach will be applied. This study will identify the sources and level of inefficiency for each of the inputs and outputs. The results show that Islamic banking in Indonesia is more efficient than Islamic banking in Malaysia in all three measures, technical, scale, and overall efficiencies. Technically, financing is one of the sources of inefficiency in Malaysia, while human resource is one of the sources of inefficiency in Indonesia. Islamic windows should be encouraged to convert to subsidiaries or Islamic full branches to improve scale and overall efficiencies in Malaysia. Furthermore, accelerated expansion, organically and inorganically, is needed to improve scale and overall efficiencies of Islamic banking in Indonesia.

JEL Classification: C14, G21, G28
Keywords: Islamic Banking, Performance, Efficiency, Data Envelopment Analysis

1. Introduction

1.1 Background

Islamic banks have been in existence since early 1960s. The first Islamic bank established in 1963 as a pilot project in the form of rural savings bank in a small town of Egypt, Mit Ghamr. After that, Islamic banking movement came back to life in mid 1970s. The establishment of Islamic Development Bank in 1975 triggered the development of Islamic banks in many countries, such as Dubai Islamic Bank in Dubai (1975), Faisal Islamic Bank in Egypt and Sudan (1977), and Kuwait Finance House in Kuwait (1977). By the end of 2005, more than 300 institutions in over 65 jurisdictions are managing assets worth around US dollars 700 - 1000 billion in a Shariah compatible manner. A large part of the banking and Takaful concentration is in Bahrain Malaysia, and Sudan. A significant part of mutual funds concentrate in the Saudi Arabian and Malaysian markets in addition to the more advanced international capital markets.

In Malaysia, Islamic financial institutions have been in existence since the establishment of the Pilgrimage fund board in 1969. Malaysia started the establishment of Islamic bank, Bank Islam Malaysia Berhad or BIMB, in 1983. To accelerate the dissemination of Islamic banking

on nationwide basis, Bank Negara Malaysia or BNM (the central bank of Malaysia) implemented Islamic banking scheme or Islamic windows structure, which allowed conventional banks to offer Islamic banking products and services using their existing infrastructure, including staff and branches. Today, Islamic financial system in Malaysia has emerged as important component that contributes to the growth and development of Malaysian economy with the creation diversity of players encompasses the domestic as well as the foreign banking players.

The Islamic banking system in Malaysia is represented by 29 Islamic banking institutions, comprising of 2 Islamic banks, 2 Islamic subsidiaries and 25 Islamic banking scheme banks offering comprehensive and wide range of Islamic financial products and services. Moreover, Islamic banking in Malaysia has reached more than 10% of the banking market share. It is envisioned in the Financial Sector Master Plan (FSMP) that the Islamic banking industry in Malaysia would achieved 20% of the banking market share in 2010.

In Indonesia, Islamic financial institutions started to emerge in early 1980s with the establishment of *Baitut Tamwil-Salman* in Bandung dan *Koperasi Ridho Gusti* in Jakarta. The first Islamic Bank in Indonesia, Bank Muamalat Indonesia, established in 1992. The development of Islamic bank has been accelerated since Bank Indonesia (the central bank of Indonesia) allowed conventional banks to open Islamic branch. This Islamic branch can offer Islamic banking products and services separated from its conventional parent with its own infrastructure, including staff and branches.

The Islamic banking system in Indonesia is currently represented by 3 Islamic banks and 19 Islamic branches, and 105 Islamic People's Credit Bank, with 620 offices and 439 office channeling spread through out the country. They offer comprehensive and wide range of Islamic financial products and services and cater 1.54% of the banking market share. It is expected that the Islamic banking industry in Indonesia would reached 5% of the banking market share in 2008.

Despite these impressive achievements, Islamic banking in Malaysia and Indonesia has experiencing a slower growth in the past two years. There are many factors that could be attributed to this slower growth. One of these factors is the competitiveness of Islamic Banks within the banking system, since, in the dual banking system, they have to compete head to head with conventional banks.

One important aspect of competitiveness is efficiency. Inefficiency would become a great disadvantage to face a fierce competition in the banking industry. To win the competition, Islamic banks should know the strengths and weaknesses of themselves as well as of their competitor. Therefore, analysis of the efficiency of Islamic banks in comparison with conventional banks is very important to give a big picture of the strengths and weaknesses of Islamic banks and their competitors.

Despite of the importance, there are very limited study focusing on the efficiency of Islamic banks compare to the efficiency of conventional banks within a country or between countries, especially in Malaysia and Indonesia. Therefore, there should be a study that measures the efficiency of Islamic banks compare to that of conventional banks. These measures could be used as a guide for Islamic banks to improve their weaknesses to be able to compete head to head with conventional banks and to achieve the intended goals to improve the market share. Moreover, the goal to strengthen Islamic banking structure could be achieved.

1.2 Objectives

The objective of this study is to compare the efficiency of Islamic banks in Malaysia and Indonesia using intermediation approach. This study will identify the sources and level of inefficiency for each of the inputs and outputs of Islamic banks and conventional banks in Malaysia and Indonesia. Moreover, this study will also compare the efficiency of Conventional and Islamic banks in Indonesia. This measurement will give the results of relative efficiency of individual bank compare to its peer group in every aspect considered.

1.3 Methodology

This study will apply Data Envelopment Analysis (DEA). DEA is a non parametric and non deterministic method to measure relative efficiency of production frontier, based on empirical data of multiple inputs and multiple outputs of decision making units. The non parametric nature of DEA makes it does not need assumption of the production function. DEA will generate production function based on data observed. Therefore, misspecification can be minimized. DEA can be applied to analyze different kind of inputs and outputs without initially assigning weight. Moreover, the efficiency produced is a relative efficiency based on observed data. Preference of decision maker can also be accommodate in the model.

2. Literature Review

Banking efficiency has been a very important issue in a transition economy. All countries in transition have been encounter at least with one banking crisis, and many with more than one crisis (Jemrić and Vujčić, 2002). Banking efficiency is also an important issue in a developing open economy, since most of them have also been faced a banking crisis in the past. Malaysia and Indonesia are no exception.

There are many studies about banking efficiency using parametric methods, but there are limited studies that measure banking efficiency using non-parametric method, particularly utilizing DEA application. Moreover, those studies mostly are applied to conventional banks. There is not much study that measures the efficiency of Islamic banks.

Three of those studies that measure efficiency of Islamic banks using DEA application are conducted by Yudistira (2003), Ascarya and Yumanita (2006), and Sufian (2006). Yudistira measured the efficiency of 18 Islamic banks from various countries during 1997 – 2000 using intermediation approach, since intermediation is a fundamental principle of Islamic banking. Ascarya and Yumanita measured the efficiency of Islamic banks in Indonesia during 2002 – 2004 using intermediation and production approaches, since Islamic banking not only can be viewed as intermediary institution, but can also be viewed as a production entity. Meanwhile, Sufian measured the efficiency of Islamic window banks in Malaysia during 2001 – 2004 using intermediation approach with the same reason as that of Yudistira.

Other studies of banking efficiency using DEA are done by Jemrić and Vujčić (2002) and Hadad *et al.* (2003). Jemrić and Vujčić measured efficiency of banks in Croatia during 1995 – 2000 using intermediation and production approach, since banking is not just functioned as intermediary, but also as a producer of loans and investments. Meanwhile, Hadad *et al.* measured efficiency of banks in Indonesia during 1995 – 2003 using asset approach to see the impact of merger and acquisition.

The efficiency measurement, parametric or non-parametric, of financial institution like banks can be approached from their activities. There are three main approaches to explain the relationship between input and output of banks. Two approaches, namely, production (or operational) approach and intermediation approach, apply the classical microeconomic theory of the firm, while one approach, namely modern (or assets) approach applies modified classical theory of the firm by incorporating some specificities of banks' activities, namely risk management and information processing, as well as some form of agency problems, which are crucial for explaining the role of financial intermediaries (Freixas and Rochet, 1998). The production approach describes banking activities as the production of services to depositors and borrowers using all available factors of production, such as labor and physical capital. The intermediation approach describes banking activities as intermediary in charge of transforming the money borrowed from depositors (surplus spending units) into the money lent to borrowers (deficit spending units). Meanwhile, the asset approach or the modern approach tries to improve the first two approaches by incorporating risk management, information processing, and agency problems into the classical theory of the firm. The summary of approaches applied by previous authors can be read in table 2.1.

Table 2.1 Summary of Approaches Applied

Author	Input	Output
Intermediation Approach		
Yudhistira'03	Staff Costs; Fixed Assets; Total Deposits	Total Loans; Other Income; Liquid Assets
Ascarya & Yumanita'06	Staff Costs; Fixed Assets; Total Deposits	Total Loans; Other Income; Liquid Assets
Sufian'06	Labor Costs[1]; Fixed Assets; Total Deposits	Total Loans; Income
Jemrić & Vujčić'02	No. of Employees; Fixed Assets & Software; Total Deposits	Total Loans; Short-term Securities
Production Approach		
Ascarya & Yumanita'06	Interest Costs; Staff Costs; Operational Costs	Interest Income; Other Operational Income
Jemrić & Vujčić'02	Interest & Related Costs; Commissions for Services & Related Costs; Labor Related Adm. Costs; Capital Related Adm. Costs	Interest & Related Revenues; Non-interest Revenues
Asset Approach		
Ascarya & Yumanita'06	Staff Costs to Total Assets; Interests Costs to Total Assets; Other Costs to Total Assets	Financing to Connected Party; Financing to Other Party; Financial Papers
Hadad *et.al*'03.	Staff Costs to Total Assets; Interests Costs to Total Assets; Other Costs to Total Assets	Financing to Connected Party; Financing to Other Party; Financial Papers

From those studies it can be concluded that asset approach is an advanced approach that views bank not only has a classical function of intermediary, but also has other various new functions. Therefore, asset approach is not suitable to be applied to Islamic banking which focuses on extending financing to the real sector. Production approach can be applied for Islamic banking, since this approach views Islamic bank as a general business unit. However, it becomes too general, so that the very essence of Islamic banking is not represented.

[1] As data on the number of employees are not readily made available, this study uses personnel expenses as a proxy measure.

Meanwhile, intermediation approach can be applied for Islamic banking since this approach views Islamic banking as an intermediary institution. However, the input and output variables should be selected carefully to really reflect the true essence of Islamic banking. Input and output variables selected by Sufian (2006) are the closest to the characteristics of Islamic banking. Some refined modifications might needed to make it more representative.

3. Methodology

The methodology of Data Envelopment Analysis or DEA will be used in this study. This DEA application is derived from the theory of efficiency. Therefore, this chapter will first discuss the theory of efficiency, the measurement of efficiency, the connection of DEA to efficiency theory, and then discuss the details of DEA. Moreover, bank's efficiency can be measured from its functions. Three approaches to measure the efficiency of bank's functions are intermediation approach, production approach, and modern or asset approach.

3.1 The Theory of Efficiency

The concept of efficiency rooted from the microeconomic concept, namely, consumer theory and producer theory. Consumer theory tries to maximize utility or satisfaction from individual point of views, while producer theory tries to maximize profit or minimize costs from producer point of views.

In the producer theory, there is a production frontier line that describes the relationship between inputs and outputs of production process. This production frontier line represents the maximum output from the use of each input. It also represents the technology used by a business unit or industry. A business unit that operates on the production frontiers is technically efficient. Figure 3.1 shows the production frontier line.

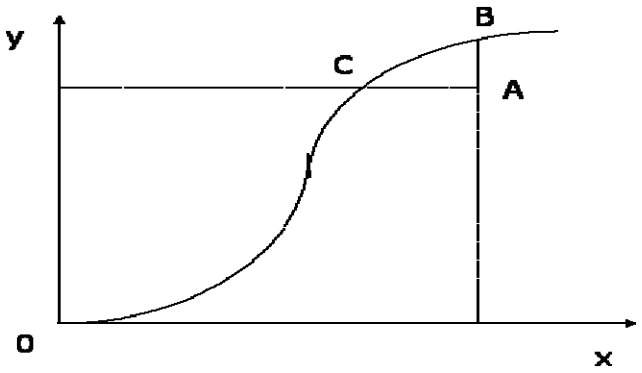

Figure 3.1 Production Frontier Line

Considered from economic theory, there are two different types of efficiency, namely technical efficiency and economic efficiency. Economic efficiency has macro economic point of view, while technical efficiency has micro economic point of view. The measurement of technical efficiency limited to technical and operational relationship in a conversion process of input to output. Whereas, in economic efficiency price can not be considered as given, since price can be influenced by macro policy (Sarjana, 1999). According to Farell (1957), efficiency comprises of two components, namely:

a. Technical efficiency describes the ability of a business unit to maximize output given certain amount of input.

b. Allocative efficiency describes the ability of a business unit to utilize inputs in optimal proportion based on their price.

When the two types of efficiency combined, it will produce economic efficiency. A company is considered to be economically efficient if it can minimize the production costs to produce certain output within common technology level and market price level.

Kumbhaker and Lovell (2000) argue that technical efficiency is only one of many components economic efficiency as a whole. Nevertheless, in order to achieve economic efficiency a company should produce maximum output with certain amount of input (technical efficiency) and produce output with the right combination within certain price level (allocative efficiency).

3.2 The Measurement of Efficiency

In the past few years, performance measurement of financial institution has increasingly focused on frontier efficiency or X-efficiency (rather than scale efficiency), which measures deviation in performance of a financial institution from the best practices or costs-efficient frontier that depicts the lowest production costs for a given level of output. X-efficiency stems from technical efficiency, which gauges the degree of friction and waste in the production processes, and allocative efficiency, which measures the levels of various inputs.

Frontier efficiency is superior for most regulatory and other purposes to the standard financial ratios from accounting statements, such as, return on asset (ROA) or cost/revenue ratio, that are commonly employed by regulators, managers of financial institutions, or industrial consultants to assess financial performance. This is because frontier efficiency measures use programming or statistical techniques that removes the effects of differences in input prices and other exogenous market factors affecting the standard performance ratios in order to obtain better estimates of the underlying performance of the managers (Bauer, *et al.*, 1998).

Frontier efficiency has been used extensively in regulatory analysis to measure the effects of merger and acquisition, capital regulations, deregulation of deposit rates, removal of geographic restrictions on branching and holding company acquisitions, etc., on financial institution performance. Furthermore, Bauer *et al.* (1998) argue that the main advantage of frontier efficiency over other indicators of performance is that it is an objectively determined quantitative measure that removes the effects of market prices and other exogenous factors that influence observed performance.

Tools to measure efficiency could be parametric and non-parametric. Parametric approach to measuring efficiency uses stochastic econometric and tries to eliminate the impact of disturbance to inefficiency. There are three parametric econometric approaches, namely:

1. Stochastic frontier approach (SFA);
2. Thick frontier approach (TFA); and
3. Distribution-free approach (DFA).

These approaches differ in the assumptions they make regarding the shape of the efficient frontier, the treatment of random error, and the distributions assumed for inefficiencies and random error. The parametric methods have disadvantages relative to the non-parametric methods of having to impose more structure on the shape of the frontier by specifying a functional form for it. However, an advantage of the parametric methods is that they allow for random error, so these methods are less likely to misidentify measurement error, transitory differences in cost, or specification error for inefficiency (Bauer, *et al.*, 1998).

Meanwhile, non-parametric linear programming approach to measuring efficiency uses non-stochastic approach and tends to combine disturbance into inefficiency. This is built based on discovery and observation from the population and evaluates efficiency relative to other units observed. One of the non-parametric approaches, known as data envelopment analysis (DEA), is a mathematical programming technique that measures the efficiency of a decision making unit (DMU) relative to other similar DMUs with the simple restrictions that all DMUs lie on or below the efficiency frontier (Seiford and Thrall, 1990). The performance of a DMU is very relative to other DMUs, especially those that cause inefficiency. This approach can also determine how a DMU can improve its performance to become efficient.

DEA was first introduced by Charnes, Cooper, and Rhodes in 1978. Since then its utilization and development have grown rapidly including many banking-related applications. The main advantage of DEA is that, unlike regression analysis, it does not require an a priori assumption about the analytical form of the production function so imposes very little structure on the shape of the efficient frontier. Instead, it constructs the best practice production function solely on the basis of observed data, and therefore the possibility of misspecification of the production technology is zero. On the other hand, the main disadvantage of DEA is that the frontier is sensitive to extreme observations and measurement error (the basic assumption is that random errors do not exist and that all deviations from the frontier indicate inefficiency). Moreover, there exists a potential problem of "self identifier" and "near-self-identifier".

3.3 Data Envelopment Analysis

Data envelopment analysis or DEA is a methodology for analyzing the relative efficiency and managerial performance of productive or decision making units (DMUs), having the same multiple inputs and multiple outputs. DEA allows us to compare the relative efficiency of (Islamic or conventional) banks by determining the efficient banks as benchmarks and by measuring the inefficiencies in input combinations (slack variables) in other banks relative to the benchmark (Jemrić and Vujčić, 2002). DEA provides an alternative approach to regression analysis. While regression analysis relies on central tendencies, DEA is based on extremal observations. While the regression approach assumes that a single estimated regression equation applies to each observation vector, DEA analysis each vector (DMU) separately, producing individual efficiency measures relative to the entire set under evaluation (Jemrić and Vujčić, 2002).

DEA is a non-parametric, deterministic methodology for determining the relative efficient production frontier, based on the empirical data on chosen inputs and outputs of a number of DMUs. From the set of available data, DEA identifies reference points (relatively efficient DMUs) that define the efficient frontier (as the best practice production technology) and evaluate the inefficiencies of other, interior points (relatively inefficient DMUs) that are below the efficient frontier (Jemrić and Vujčić, 2002). Besides producing efficiency value for each DMU, DEA also determines DMUs that are used as reference for other inefficient DMUs.

$$Efficiency of\ DMU_0 = \frac{\sum_{k=1}^{p} \mu_k y_{k0}}{\sum_{i=1}^{m} v_i x_{i0}}$$

DMU = decision making unit	n : number of DMU evaluated
m : different inputs	x_{ij} : number of input i consumed by DMU_j
p : different outputs	y_{kj} : number of output k produced by DMU_j

There are two DEA models that are most frequently used, namely, the CCR model (Charnes, Cooper, and Rhodes, 1978) and the BCC model (Banker, Charnes, and Cooper, 1984). The main difference between these two models is the treatment of return to scale. The CCR assumes that each DMU operates with constant return to scale, while the BCC assumes that each DMU can operate with variable return to scale.

CCR model assumes that the ratio of additional input and output is equal (constant return to scale). It means that an additional input of x times will produce additional output of x times. Another assumption is that every DMU operates on an optimal scale. Therefore the efficiency of DMU can be measured as a maximum of a ratio weighted outputs to weighted inputs. Meanwhile, BCC model assumes that every DMU has not (or not yet) operated on optimal scale. This model assumes that the ratio of additional input and output is not equal (variable return to scale). It means that an additional input of x times will not produce additional output of exactly x times, but it can be less or greater than x times.

Generally, the efficiency score of CCR model for each DMU will not exceed the efficiency score of BCC model. This is because BCC model analysis each DMU "locally" (i.e. compared to the subset of DMUs that operate in the same region of return to scale) rather than "globally (Jemrić and Vujčić, 2002). Furthermore, a business or DMU, like bank, has similar characteristics one to another. However, each bank usually varies in size and production level. This indicates that size matters in relative efficiency measurement. CCR model represents (the multiplication of) pure technical and scale efficiencies, while BCC model represents technical efficiency only. Therefore, the relative scale efficiency is a ratio of CCR model and BCC model.

$$S_k = q_{k,CCR}/q_{k,BCC}$$

If the value of S = 1 means that the DMU operates in the best relative scale efficiency, or in optimal size. If the value of S is less than 1 means that there still exists scale inefficiency of the DMU. Therefore, the value of (1-S) represents the level of inefficiency of the DMU. Consequently, when a DMU is efficient under BCC model, but inefficient under CCR model, this means that the DMU has scale inefficiency. This is because the DMU is technically efficient, so that the inefficiency that exists comes from the scale.

OE = TE x SE --> SE = OE/TE

OE: overall efficiency of CCR Model; TE: technical efficiency of BCC Model

4. Formulation of Performance Indicators

Islamic bank is essentially a business entity and mainly functioned as financial intermediary and service provider that operate in compliance with Shariah. In addition, Islamic bank is a part of Islamic economic system and a part of Islamic teaching which bring *rahmatan lil alamin* 'mercy to all that exist', so that Islamic bank should also take part in improving social welfare and justice, and minimizing the gap between the rich and the poor. In line with this definition, the objective of Islamic bank is not only to gain profit Islamically, but also to bring benefit to the society. Therefore, performance measurement of Islamic bank should cover all of these aspects comprehensively.

The General Council for Islamic Banks and Financial Institutions CIBAFI (2006) issued performance indicators for Islamic Financial Institutions include: 1) asset quality and composition; 2) capital structure; 3) profitability; 4) efficiency; 5) liquidity; and 6) growth. Samad and Hassan (2000) measure performance of Islamic bank focusing on four financial ratios, namely: 1) profitability; 2) liquidity; 3) risk and solvency; and 4) commitment to economy and Muslim community. Hameed *et al.* (2003) propose Islamicity disclosure index, which include: 1) Shariah compliance; 2) Corporate governance; and 3) Social/ environmental) and Islamicity performance index, which include: 1) profit sharing ratio; 2) zakah performance ratio; 3) equitable distribution ratio; 4) directors-employees welfare ratio; 5) Islamic investment ratio; 6) Islamic income ratio; and 7) AAOIFI index. Moreover, Maali *et.al.* (2006) identify three social disclosures as benchmark for social reporting, namely: 1) to show compliance with Islamic principles, in particular dealing justly with different parties; 2) to show how the operations of the business have affected the wellbeing of the Islamic community; and 3) to help Muslims to perform their religious duties.

Meanwhile, from indepth interviews and focus group discussions, Islamic bank performance measurement should fulfill its responsibility to shareholders (such as financial soundness and sustainability), to customer (such as customer satisfaction), to employee (such as fair treatment, facility and encouragement to perform religious duties), and to society (such as role in improvement of social welfare and employment). Therefore, we suggest that comprehensive performance measurement should cover business, social, ibadah/da'wah, and shariah compliance aspects. Parameters of each aspect should reflect the true essence and characteristics of Islamic banking.

1. Business aspect measures the performance of an institution as a business entity, which could include financial, management, operation, etc. Business aspect, including efficiency and profitability, is important since sound and profitable business is needed for an institution to be able to serve and bring benefit to the society.
2. Social aspect measures the contribution of an institution made to the society, which could include zakah, infaq and shadaqah (ZIS), qardhul hasan, commitment to Muslims, commitment to micro, small and medium enterprises (MSMEs), commitment to under developed areas, corporate social responsibility (CSR), charitable activities, community involvement, etc.
3. Ibadah/da'wah aspect measures the effort of an institution to help Muslims to perform their religious duties and improve their God consciousness (iman), which could include iman improvement for employees, ibadah facilities, socialization, etc.
4. Shariah compliance aspect measures the adherence of an institution's activities to Islamic laws, which could include profit-and-loss sharing (PLS) ratio, financing to deposit ratio (FDR), unlawful transactions, etc.

Within this holistic view, the measure of efficiency is only one part of performance indicators of business aspect. Efficiency measure should be viewed with caution that minimize inputs to produce maximize outputs is a capitalist mindset that could have a part of unjustness (*dzulm*), which should be avoided. Therefore, it would be better if the formulation of efficiency should be redefined to be in accordance to Islamic teachings. Moreover, Islamic bank should not only be measured by its efficiency, but should be measured by its overall performance comprehensively.

5. Data Analysis

5.1 Data Description

The data needed for this empirical analysis comes from financial statements of Islamic banks in Malaysia and Indonesia in the period of 2002 – 2005. The type and number of banks in the analysis can be read on table 5.1. There are two types of Islamic banks in Malaysia, namely, full fledged Islamic bank and conventional bank that offer Islamic banking products called Islamic window (domestic and foreign owned). While in Indonesia, there are also two types of Islamic banks, namely, full fledged Islamic bank and conventional bank that have separate Islamic branch or Islamic business unit. Some data on newest and remote Islamic Regional Development Branches are not yet available, so that they are not included in the analysis.

[Insert Table 5.1]

This studi will adopt a modification of intermediation approach to better reflect Islamic bank activities, as also adopted by Sufian (2006). Accordingly, we assume that Islamic banks produce Total Loans ($\mathbf{y_1}$) and Income ($\mathbf{y_2}$) by employing Total Deposits ($\mathbf{x_1}$), Labor ($\mathbf{x_2}$) and Fixed Assets ($\mathbf{x_3}$). Liquid assets are not included in this study as output variable, since Islamic banks are not in the business of financial instruments in the financial markets, but in the business of providing financing to the real sector. As data on the number of employees are not readily made available, we use personnel expenses as a proxy measure. Table 5.2 presents the aggregate series of inputs and outputs of Malaysian and Indonesian Islamic banks included in this study.

[Insert Table 5.2]

Some conclusions can be drawn. Firstly, over the four-year period, total assets of Malaysian Islamic banking operations grew by about 54%, while Indonesian Islamic banking grew even more impressive by 222%, although it still significantly smaller ($1/16^{th}$) than that of Malaysia. Secondly, during this period, there has been increasing awareness among Malaysian and especially Indonesian public about Islamic banking and finance substantiated by the growth in total deposits of 44% and 702% respectively. Thirdly, the contribution of Islamic banking in the economy has been increasing substantially reflected by the growth in total financing extended of 82% in Malaysia and 215% in Indonesia. High financing to deposits ratio reflects the contribution of Islamic banks to the real sector. Malaysia recorded an increasing trend of FDR to reach the highest of 72.5% in 2004 and then slightly declined to 71.8% in 2005. Indonesia has always recorded high FDR of more than 100% and still recorded 123.5% in 2005. Fourthly, conclusion could also be made about employment in the Islamic banking industry during this period. It is clear from table 5.2 that Islamic banking and finance industry in Malaysia and Indonesia has created significant employment during this period. As data on the number of employees are not readily made available, we use personnel expenses as a proxy measure. From table 5.2 it is apparent that personnel expenses have expanded by approximately 61% in Malaysia and 135% in Indonesia. Finally, the Islamic banking and finance industry has increasingly generated awesome returns. During the period of study, we have witnessed more than 75% and 172% increase in total income of Malaysian and Indonesian Islamic banks, respectively. Table 5.3 and 5.4 in the appendix present the summary of statistics for the inputs and outputs for Islamic banks included in this study for Malaysia and Indonesia, respectively.

5.2 Pre Tests

Theoretically, DEA does not require the proof that the samples are indeed belong to the same population and similar level of technology, so that they can be compared "apple to apple". But, since DEA assumes that random errors do not exist and that all deviations from the frontier indicate inefficiency, therefore DEA is sensitive to extreme observations and measurement error. To minimize this disadvantage, some parametric and non-parametric pre tests are done to make sure that all samples are drawn from the same population, so that they are comparable. The pre tests results summary can be read in table 5.5.

[Insert Table 5.5]

The null hypothesis tested that Malaysian and Indonesian Islamic banks are drawn from the same population and have identical technologies by using a series of parametric (ANOVA and *t*-test) and non-parametric (Mann-Whitney [Wilcoxon Rank-Sum]) tests. Based on most of the results presented in Table 5.5, we failed to reject the null hypothesis at the 0.05 levels of significance that the Malaysian Islamic banks and Indonesian Islamic banks come from the same population and have identical technologies. This implies that, there is no significant difference between the Malaysian and Indonesian Islamic banks technologies (frontiers) and that it is appropriate to construct a combined frontier.

5.3 Results and Analysis

The efficiency of Islamic banks in Malaysia and Indonesia are measured in several ways by applying DEA method. To make a comparable measurement, Malaysian and Indonesian Islamic Banks are pooled together to form a common frontier. First, all banks are measured for each year from 2002 to 2005. Second, all banks for all years are pooled to measure overall efficiency. Table 5.6 reports the sample statistics of the various efficiency scores of Malaysian and Indonesian Islamic banks for the years 2002 (Panel A), 2003 (Panel B), 2004 (Panel C), 2005 (Panel D), and all banks all years (Panel E).

[Insert Table 5.6]

The results suggest that overall efficiency of Malaysian Islamic banks have exhibited slight improvement and reach the highest mean of 74.8% in 2004 (Panel C), and then a slight decline to 74.2% in 2005 (Panel D). The decomposition of overall efficiency into its pure technical and scale efficiency components suggest that technical inefficiency dominates scale inefficiency of Malaysian Islamic banks for all years. Technical efficiency has been somewhat declining to 80.7% in 2005 (Panel D), while scale efficiency has been somewhat improving to 91.9% in 2005 (Panel D). This implies that during the period of study, Malaysian Islamic banks have been operating at slight improved scale of operations, but technically slightly deteriorated (see figure 5.1, left).

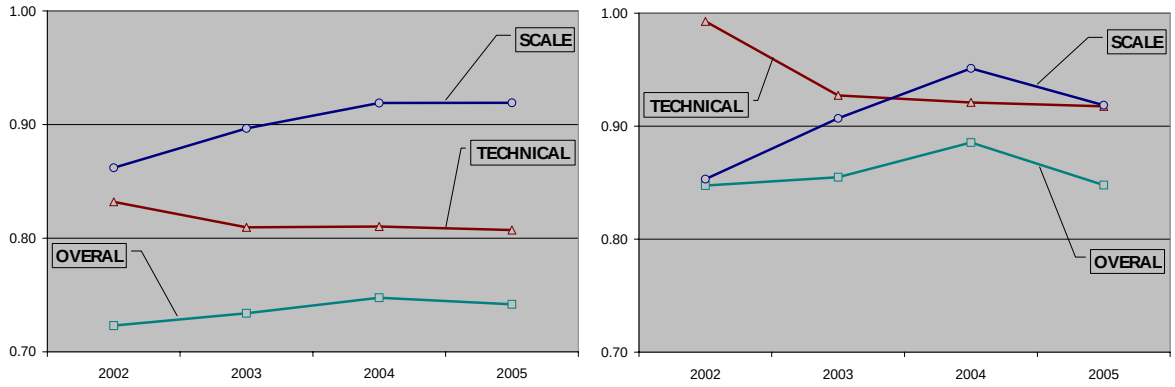

Figure 5.1 Efficiency of Islamic Banks in Malaysia and Indonesia

Meanwhile, the overall efficiency of Indonesian Islamic banks has been stable to reach the highest mean of 88.5% in 2004 (Panel C) and finally reach 84.8% in 2005 (Panel D). The decomposition of overall efficiency into its pure technical and scale efficiency components suggest that technical inefficiency has been declining to 91.8% in 2005, while scale efficiency has been improving to 95.1% in year 2004 and declined in 2005 to reach 91.9%. This shows that during aggressive expansion from 2002 to 2004 scale efficiency improved, but technical efficiency deteriorated, while during moderate expansion in 2005 technical efficiency somewhat constant, but scale efficiency deteriorated (see figure 5.1, right).

Overall, from table 5.6, it can be concluded that during 2002 to 2005 Indonesian Islamic banks are relatively more efficient than Malaysian Islamic banks in all three efficiency measurements (overall, technical, and scale efficiencies). Only in 2002 (Panel A) Malaysian Islamic banks exhibited slightly better scale efficiency than Indonesian Islamic banks.

Moreover, the scale efficiency of Islamic banks can also be viewed from the trend of the return to scale (RTS)[2] measured by DEA. Scale efficient banks exhibit constant return to scale (CRS). Banks experiencing economies of scale exhibit increasing return to scale (IRS), which means that the bank operates at a wrong scale of operation. Banks experiencing diseconomies of scale exhibit decreasing return to scale (DRS). Table 5.7 shows the results of return to scale.

[Insert Table 5.7]

The number of Malaysian Islamic banks operating at efficient scale has been almost constant during the period of observation. Six out of 15 Islamic banks have operated efficiently in 2005. Islamic banks experiencing economies of scale have been decreasing from time to time and reach 2 out of 15 Islamic banks in 2005, while Islamic banks experiencing diseconomies of scale have been increasing to 7 banks in 2005 (see figure 5.2, left).

[2] RTS are the increase in output that results from increasing all inputs. There are three possible cases. (1) Constant Returns to Scale or CRS (RTS=0), which arise when percentage change in outputs = percentage change in inputs; (2) Decreasing Returns to Scale or DRS (RTS=-1), which occur when percentage change in outputs < percentage change in inputs; (3) Increasing Returns to Scale or IRS (RTS=1), which occurs when percentage change in outputs > percentage change in inputs.

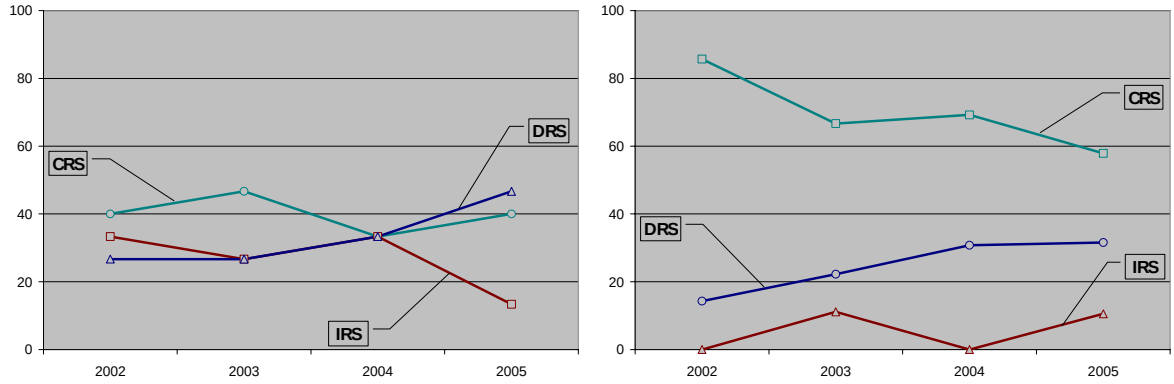

Figure 5.2 Return to Scale of Islamic Banks in Malaysia and Indonesia

Meanwhile, Indonesian Islamic banks operate at efficient scale have been increased in number, but have been decreased in percentage during the period of observation. Eleven out of 19 Islamic banks have operated efficiently in 2005. Islamic banks experiencing diseconomies of scale have been increasing from time to time and reach 6 out of 19 Islamic banks in 2005, while Islamic banks experiencing economies of scale have been somewhat constant at 2 banks in 2005 (see figure 5.2, right). Aggressive expansion of Islamic banking industry in Indonesia during the period of observation has been reflected in the increase of scale inefficient banks. Overall, from table 5.7, it can be concluded that there are more Indonesian Islamic banks operating at scale efficient, while there are more Malaysian Islamic banks operating at diseconomies of scale.

Deeper analysis can be done by investigating into individual results. Table 5.8 in the appendix shows the summary of efficiency measures in 2005. In Malaysia, almost all Islamic banks are either operating at diseconomies of scale (DRS) or operating at scale efficient (CRS). Larger Islamic banks tend to be more efficient than smaller Islamic banks, while profitable Islamic banks are all efficient. Moreover, being smaller Islamic banks, all foreign window banks exhibited decreasing return to scale or were experiencing diseconomies of scale (DRS). The decomposition of overall efficiency into its pure technical and scale efficiency components suggest that foreign window banks were almost scale efficient and that the inefficiency was mainly attributed to technical[3].

Moreover, in Indonesia, almost all Islamic banks are either operating at scale efficient (CRS) or operating at diseconomies of scale (DRS). Islamic banks experiencing CRS mostly are older banks, while Islamic banks experiencing DRS mostly are newer banks. This is true since for the year 2005 there are six new Islamic banks added in the analysis, while existing banks are also still expanding. Moreover, profitable Islamic banks in Indonesia also tend to be efficient banks, similar to those in Malaysia. However, in Indonesia, size does not always correspond with efficiency. Most large Islamic banks are efficient, but some smaller Islamic banks are also efficient. The latter also proved that small banks do not always scale inefficient.

Other than generating efficient frontier, one salient feature of DEA is that it can generate set of references for inefficient DMUs (Islamic banks) to benchmark to. Table 5.9 shows Islamic banks that are referenced by other inefficient Islamic banks in 2005. There are more Indonesian Islamic banks on efficient frontiers that set as benchmarks for other inefficient Islamic banks to make improvements. Indonesian Islamic banks have been benchmarked 51

[3] These findings are contradict to the findings of Sufian (2006), where he found that foreign window banks were almost scale efficient and the inefficiency were mainly attributed to scale.

times, while Malaysian Islamic banks have been benchmarked only 16 times. Bank Muamalat Indonesia has been the most referred bank, while EON Bank has been the second most referred bank.

Table 5.9 Reference Set

No	Bank	Count	No	Bank	Count
1	Bank Muamalat Indonesia	13	8	Bank Tabungan Negara	2
2	*EON Bank*	12	9	Bank Jabar	2
3	Bank DKI	12	10	*Public Bank*	1
4	Bank BRI	11	11	*Hong Leong Bank*	1
5	Bank IFI	7	12	Bank Danamon	1
6	*Maybank*	3	13	*Affin Bank*	1
7	Bank Syariah Mandiri	3			

Another useful feature of DEA is that it can identify the source of inefficiency for each DMUs. In general, the source of inefficiency for Malaysian Islamic banks in 2005 can be read in figure 5.3 (left). The most efficient element of Malaysian Islamic banking is income, while the most inefficient element is financing. From 25.8% inefficiency occurred in 2005, 52.39% can be attributed to financing extended. This means that Malaysian Islamic banks should improve their financing to deposit ratio (FDR) further from the 2005 figure of 71.8%. This is very true since the core business of Islamic bank is extending financing to the real sector. Therefore, financing should be given more attention for improvement. Moreover, all three elements of input can also be improved further in less priority than financing.

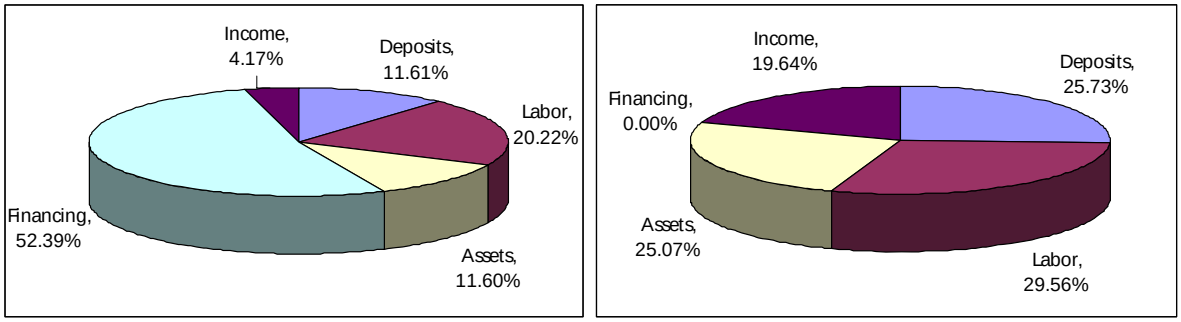

Figure 5.3 Potential Improvements for Islamic banks in Malaysia and Indonesia

Meanwhile, the source of inefficiency for Indonesian Islamic banks in 2005 can be read in figure 5.3 (right). Contrary to the Malaysian case, the most efficient element of Indonesian Islamic banking is financing, while the most inefficient element is labor costs. From 15.2% inefficiency occurred in 2005, 29.56% can be attributed to personnel expenses. This is the case in Indonesia where the supply of human resource is always lagging behind the demand of this still fast growing industry. Even though there are more and more universities and higher educational institutions offering Islamic Economic and Finance, the number of graduates are still could not catch up with the demand. The consequence of this is either the wage goes up or/and the human resource quality goes down. Therefore, Indonesian Islamic banks should give more attention to human resource to improve their efficiency. Moreover, other elements of input can also be improved further in less priority than human resource.

All in all, Indonesian Islamic banks are relatively more efficient than Malaysian Islamic banks in all three measures during the period of study. This can be attributed, among others, to efficient financing activities. Financing to deposit ratios has always been high above 100

percent, reflecting high contribution of Indonesian Islamic banking to the real sector. However, it should be noted that this high FDR could also mean that the pace of deposit mobilization activities are slower than the pace of financing activities. One of the reasons is that when the interest rate high, some deposits (mostly corporate) are shifting from Islamic banking to conventional banking searching for higher return.

6. Conclusions and Recommendations

6.1 Conclusions

- Islamic banking in Malaysia has been in existence 10 years earlier than that of Indonesia, and its size is much larger than that of Indonesia by 16 times in asset size.
- Even though scale efficiency has reached 92%, overall efficiency has not been changed much at around 74%, due to low technical efficiency. There are only 40% efficient Islamic banks in Malaysia from 2002 – 2005, while the most are still inefficient. Large Islamic window banks tend to be more efficient than the small ones.
- The majority of Malaysian Islamic banks (7) have been experiencing diseconomies of scale (DRS) in 2005, especially small and foreign owned banks. Efficient banks (CRS) mostly are large domestic window banks. Profitable banks tend to be efficient banks.
- In a relatively infant stage and small size, Indonesian Islamic banking has recorded high overall efficiency of 85%, mainly due to the improvement in scale efficiency from impressive growth in the period of observation. Technical efficiency has always been high and in a higher level than that of Malaysia, although, lately, it has been deteriorated slightly. The percentage of efficient banks in Indonesia has been declining overtime from 86% (6 out of 7) in 2002 to 58% (11 out of 19) in 2005. This can also be attributed to the rapid expansion, especially the establishment of new Islamic branches.
- Banks experiencing diseconomies of scale (DRS) have been increased from 14.3% (1 out of 6) in 2002 to 31.6% (6 out of 19). Efficient banks (CRS) vary from size and type, but usually are older Islamic banks. Profitable banks tend to be efficient banks.
- Labor has been a problem of Islamic banks in Indonesia, which should be given top priority for improvement. Also, Islamic banks need further expansion, organically and inorganically, to improve its scale and overall efficiency.

6.2 Recommendations

- Islamic banks in Malaysia should redirect their orientation not to follow the path of conventional banks, which focus on monetary sector, by giving more priority on financing activities to improve their FDR, since Islamic bank should focused on real sector, not on monetary sector. One policy alternative is to give incentive for Islamic banks that extend more financing and/or to give disincentive for Islamic banks that maintain excess liquidity and opt to place them in short-term financial instruments.
- The size of Islamic (window) bank matters in Malaysia. Therefore, window banks should be encouraged to convert to subsidiaries or full branches that are separate from their parent conventional banks to improve their scale and overall efficiencies.
- Islamic banks in Indonesia are still young and small, so that expansion should be the number one priority to reach economies of scale and critical mass in the shortest time possible. Other than organic expansion that naturally slow, to accelerate expansion

Islamic banks in Indonesia (i.e. the government) should also have the political will, commitment, and courage to expand inorganically by converting one state owned conventional bank into Islamic bank, preferably the one that have large networks.

- Human resource has always been a problem in Indonesian Islamic banking. The improvement of the human resources could be done with two strategies, namely, short term and long term. In the short term, education and training should be conducted for every level of management. In the long term, special fields of study in Islamic economic and finance should be opened in graduate and undergraduate levels, as well as inserting Islamic economic and finance curriculum in high school.
- The improvement of the human resources from the regulator side could be done by requiring banks to spend minimum budget for human resources development. Moreover, the government or regulator could give incentives by financing participation in human resources development. The regulator could also provide free training for Islamic bank officers.

References

Ascarya and Yumanita, Diana. "Analisis Efisiensi Perbankan Syariah di Indonesia dengan Data Envelopment Analysis", *TAZKIA Islamic Finance and Business Review*, Vol.1, No.2 (2006).

Bauer, Paul W., Berger, Allen N., Ferrier, Gary D., and Humphrey, David B. "Consistency Conditions for Regulatory Analysis of Financial Institutions: A Comparison of Frontier Efficiency Methods", Federal Reserve, *Financial Services Working Paper*, 02/97 (1998).

Berger, Allen N., Humphrey, David B. "Efficiency of Financial Institutions: International Survey and Directions for Future Research", *European Journal of Operational Research* (1997).

General Council for Islamic Banks and Financial Institutions. *CIBAFI Performance Indicators*, CIBAFI, 2006.

Coelli, Tim, Rao, DS. Prasada, and Battese, George E. *An Introduction to Efficiency and Productivity Analysis*, Kluwer Academic Publishers, 1998.

Denizer, Cevdet A., *et al. Measuring Banking Efficiency in the Pre and Post Liberalization Environment: Evidence from the Turkish Banking System*, World Bank, 2000.

Farrell, M.J. "The Measurement of Productive Efficiency," *Journal of The Royal Statistical Society*, 120, 253-81 (1957).

Freixas, Xavier and Rochet, Jean-Charles. *Microeconomics of Banking*, The MIT Press, Cambridge, Massachusetts, London, England, 1998.

Hadad, Muliaman D., *et al.* "Analisis Efisiensi Industri Perbankan Indonesia: Penggunaan Metode Nonparametrik Data Envelopment Analysis (DEA)", Biro Stabilitas Sistem Keuangan Bank Indonesia, *Research Paper*, no. 7/5, (2003).

Hameed, Shahul M.I. *et al.* "Alternative Disclosure and Performance Measures for Islamic Banks", *Paper*, Presented at International Conference on Management and Administrative Sciences, Faculty of Economics, University of King Fahd Petroleum and Mineral (2003).

Jemrić, Igor and Vujčić, Boris. "Efficiency of Banks in Croatia: A DEA Approach, Croatian National Bank", *Working Paper*, 7 February (2002).

Kumbhaker, Subal C. and Lovell, C.A. Knox. *Stochastic Frontier Analysis*, Cambridge University Press, United Kingdom, 2004.

Maali, Basam *et al*. "Social Reporting by Islamic Banks", *Abacus*, Vol.42, No.2 (2006).

Samad, Abdus and Hassan, M. Kabir. "The Performance of Malaysian Islamic Bank during 1984-1997: An Exploratory Study", *International Journal of Islamic Financial Services*, Vol.1, No.3, October-December (1999).

Sufian, Fadzlan. "The Efficiency of Islamic Banking Industry in Malaysia: Foreign Versus Domestic Banks", *Paper*, INCEIF Colloquium, Malaysia, April (2006).

Yudistira, Donsyah. "Efficiency in Islamic Banking; An Empirical Analysis of 18 Banks", *Paper*, Loughborough University, United Kingdom (2003).

Appendix

Table 5.1 Data of Islamic Banks

	2002	2003	2004	2005
Malaysia				
Domestic Full Fledged	2	2	2	2
Domestic Window	9	9	9	9
Foreign Window	4	4	4	4
Indonesia				
Domestic Full Fledged	2	2	3	3
Domestic Full Branch (included)	5	7	10	16
Domestic Full Branch (no data)	1	1	5	3

Table 5.2 Inputs and Outputs Data (Real US$.000)

	2002	2003	2004	2005	Growth
Malaysia					
Deposits	13,141,963	14,541,280	16,304,807	18,921,325	44.0
Labor	47,417	57,465	61,694	76,225	60.8
Assets	14,665,918	17,097,693	18,396,941	22,537,563	53.7
Financing	7,470,068	9,755,250	11,817,295	13,582,279	81.8
Income	497,820	623,390	748,052	869,034	74.6
FDR	56.8	67.1	72.5	71.8	
Indonesia					
Deposits	110,371	550,617	940,023	885,359	702.2
Labor	8,580	13,060	19,084	20,174	135.1
Assets	433,713	854,425	1,400,265	1,395,608	221.8
Financing	347,468	598,175	1,041,176	1,093,134	214.6
Income	51,847	85,358	140,256	141,101	172.1
FDR	314.8	108.6	110.8	123.5	
Malaysia: Indonesia					
Deposits	119.1	26.4	17.3	21.4	
Labor	5.5	4.4	3.2	3.8	
Assets	**33.8**	**20.0**	**13.1**	**16.1**	
Financing	21.5	16.3	11.3	12.4	
Income	9.6	7.3	5.3	6.2	

Table 5.3 Descriptive Statistics of Malaysian Islamic Banks

	2002 ($ 000)	2003 ($ 000)	2004 ($ 000)	2005 ($ 000)
OUTPUT				
Total Financing				
Min	5,473	4,448	2,923	1,546
Mean	498,005	650,350	787,820	905,485

Max	2,171,982	3,044,636	3,712,326	3,978,985
S.D	619,756	848,942	984,796	1,073,597
Income				
Min	1,042	1,539	2,913	985
Mean	33,188	41,559	49,870	57,936
Max	145,517	148,730	155,722	183,899
S.D	44,444	43,333	49,963	60,753
INPUT				
Total Deposits				
Min	16,386	25,442	159,772	107,226
Mean	876,131	969,419	1,086,987	1,261,422
Max	3,201,733	3,272,005	4,064,761	4,579,731
S.D	999,222	1,065,232	1,148,374	1,344,370
Labor Costs				
Min	196	233	117	105
Mean	3,161	3,831	4,113	5,082
Max	19,782	22,929	23,897	32,750
S.D	6,002	6,867	7,150	9,372
Assets				
Min	24,488	39,155	213,591	129,197
Mean	977,728	1,139,846	1,226,463	1,502,504
Max	3,474,857	4,052,667	3,966,089	5,655,260
S.D	1,090,688	1,237,634	1,164,147	1,557,892

Table 5.4 Descriptive Statistics of Indonesian Islamic Banks

	2002 ($ 000)	**2003** ($ 000)	**2004** ($ 000)	**2005** ($ 000)
OUTPUT				
Total Financing				
Min	607	3,348	485	772
Mean	49,638	66,464	80,090	57,533
Max	188,410	243,709	483,915	438,709
S.D	71,338	96,747	157,981	134,216
Income				
Min	23	479	35	37
Mean	7,407	9,484	10,789	7,426
Max	26,564	38,878	64,030	60,130
S.D	11,365	15,912	21,179	17,481
INPUT				
Total Deposits				
Min	411	2,597	394	301
Mean	15,767	61,180	72,309	46,598
Max	87,394	237,872	437,862	374,120
S.D	32,208	100,576	146,307	114,040
Labor Costs				
Min	93	84	29	17
Mean	1,226	1,451	1,468	1,062

Max	3,889	5,887	7,405	8,836
S.D	1,607	2,141	2,416	2,108
Assets				
Min	1,511	4,709	1,675	1,434
Mean	61,959	94,936	107,713	73,453
Max	229,304	356,133	635,353	546,614
S.D	91,560	147,355	204,025	162,039

Table 5.5 Summary of Parametric and Non Parametric Tests for the Null Hypothesis that Malaysian and Indonesian Islamic Banks Possess Identical Technologies

	Test Group		
	Parametric		Non Parametric
Individual Test	**ANOVA Test**	**t-test**	**Mann-Whitney**
Hypothesis	$Mean_I=Mean_M$		$Median_I=Median_M$
Test Statistics	F(Prb>F)	t(Prb>t)	z(Prb>z)
Overall Efficiency	0.3305	0.645	(0.004)
Technical Efficiency	0.3540	0.492	(0.004)
Scale Efficiency	0.0003	0.051	(0.017)
	Accept Ho: There is no significant difference		

Table 5.6 Summary Statistics of Efficiency Measures

Efficiency Measures	Mean	Minimum	Maximum	Std Dev
Panel A. 2002				
MALAYSIA				
Overall Efficiency	0.723	0.295	1.000	0.243
Technical Efficiency	0.832	0.346	1.000	0.222
Scale Efficiency	0.862	0.581	1.000	0.133
INDONESIA				
Overall Efficiency	0.847	0.366	1.000	0.232
Technical Efficiency	0.993	0.949	1.000	0.019
Scale Efficiency	0.853	0.366	1.000	0.229
Panel B. 2003				
MALAYSIA				
Overall Efficiency	0.734	0.245	1.000	0.284
Technical Efficiency	0.809	0.288	1.000	0.247
Scale Efficiency	0.897	0.527	1.000	0.169
INDONESIA				
Overall Efficiency	0.855	0.333	1.000	0.224
Technical Efficiency	0.927	0.476	1.000	0.172
Scale Efficiency	0.907	0.699	1.000	0.117
Panel C. 2004				
MALAYSIA				

Overall Efficiency	0.748	0.323	1.000	0.229
Technical Efficiency	0.810	0.328	1.000	0.208
Scale Efficiency	0.919	0.630	1.000	0.135
INDONESIA				
Overall Efficiency	0.885	0.437	1.000	0.187
Technical Efficiency	0.921	0.659	1.000	0.130
Scale Efficiency	0.951	0.663	1.000	0.103
Panel D. 2005				
MALAYSIA				
Overall Efficiency	0.742	0.068	1.000	0.270
Technical Efficiency	0.807	0.071	1.000	0.250
Scale Efficiency	0.919	0.520	1.000	0.150
INDONESIA				
Overall Efficiency	0.848	0.338	1.000	0.200
Technical Efficiency	0.918	0.461	1.000	0.158
Scale Efficiency	0.919	0.622	1.000	0.128
Panel E. ALL YEAR				
MALAYSIA				
Overall Efficiency	0.684	0.059	1.000	0.255
Technical Efficiency	0.750	0.059	1.000	0.253
Scale Efficiency	0.919	0.530	1.000	0.143
INDONESIA				
Overall Efficiency	0.724	0.171	1.000	0.219
Technical Efficiency	0.830	0.332	1.000	0.197
Scale Efficiency	0.867	0.376	1.000	0.163

Table 5.7 Return to Scale

	2002		2003		2004		2005	
	Bank	**% Share**	**Bank**	**% Share**	**Bank**	**% Share**	**Bank**	**% Share**
Overall								
CRS	12	54.5	13	54.2	14	50.0	17	50.0
IRS	5	22.7	5	20.8	5	17.9	4	11.8
DRS	5	22.7	6	25.0	9	32.1	13	38.2
TOTAL	22	100.0	24	100.0	28	100.0	34	100.0
Malaysia								
CRS	6	40.0	7	46.7	5	33.3	6	40.0
IRS	5	33.3	4	26.7	5	33.3	2	13.3
DRS	4	26.7	4	26.7	5	33.3	7	46.7
TOTAL	15	100.0	15	100.0	15	100.0	15	100.0
Indonesia								
CRS	6	85.7	6	66.7	9	69.2	11	57.9
IRS	0	0.0	1	11.1	0	0.0	2	10.5
DRS	1	14.3	2	22.2	4	30.8	6	31.6
TOTAL	7	100.0	9	100.0	13	100.0	19	100.0

Table 5.8 Summary of Efficiency Measures 2005

Size	BANK	Assets	2005		2004		2003		2002	
Mal	**Domestic Full Fledged**		**OE**	**ROA**	**OE**	**ROA**	**OE**	**ROA**	**OE**	**ROA**
2	Bank Islam Malaysia	3,928,457	0.66	-3.20	0.68	0.58	0.55	0.57	0.64	0.28
3	Bank Muamalat	2,545,530	0.45	0.31	0.49	-0.36	0.38	0.05	0.57	0.29
Mal	**Domestic Window**									
1	Maybank	5,655,260	1.00	1.68	1.00	0.90	1.00	0.77	1.00	1.35
4	Public Bank	1,994,331	1.00	2.62	0.84	2.50	0.91	1.88	0.83	1.69
5	RHB Islamic Bank	1,889,672	0.56	0.54	0.99	2.18	0.69	1.08	0.69	1.01
6	Hong Leong Bank	1,441,707	1.00	1.39	1.00	1.68	1.00	2.04	1.00	1.43
7	Hong Kong Bank	1,302,628	0.82	0.78	0.93	0.50	0.95	-0.38	1.00	2.65
8	EON Bank	1,061,960	1.00	2.47	1.00	1.88	1.00	1.50	0.81	1.07
9	Affin Bank	904,394	1.00	0.85	0.85	1.03	1.00	1.22	0.98	0.94
16	Southern Bank	202,439	0.79	0.67	0.73	1.05	0.77	5.04	0.73	3.65
17	Commerce Tijari	129,197	0.07	-3.15	-	-	-	-	-	-
	Arab-Malaysian Bank	338,447	-	-	0.69	-1.25	0.81	0.18	0.57	1.07
Mal	**Foreign Window**									
10	OCBC	582,394	0.77	0.88	0.72	0.62	0.35	0.44	0.36	0.65
13	Alliance Bank	384,206	0.80	0.90	0.62	0.92	0.25	0.94	0.29	1.11
14	Citibank	266,457	0.43	0.94	0.35	0.55	1.00	1.45	0.94	3.84
15	Standard Chartered Bank	248,932	0.79	0.30	0.32	0.48	0.36	1.36	0.42	2.61
Ind	**Domestic Full Fledged**									
11	Bank Syariah Mandiri	546,614	1.00	1.18	0.99	1.51	0.72	0.53	1.00	1.55
12	Bank Muamalat Ind	511,232	1.00	2.11	1.00	1.54	0.90	1.59	1.00	2.06
20	Bank Syariah Mega Ind	38,904	0.89	0.81	0.77	2.51	-	-	-	-
Ind	**Domestic Full Branch**									
18	Bank Negara Indonesia	91,912	0.84	2.05	0.91	N/A	1.00	0.01	1.00	N/A
19	Bank BRI	43,936	1.00	0.34	1.00	-3.76	0.76	-8.41	0.37	-15.22
22	Bank Bukopin	26,098	0.99	0.56	1.00	1.73	1.00	0.27	0.89	-2.57
23	Bank Danamon	24,457	1.00	-11.77	1.00	0.21	0.98	-2.47	0.74	-10.18
24	Bank Niaga	22,402	0.85	-0.57	0.44	N/A	-	-	-	-
26	Bank Tabungan Negara	10,844	1.00	-0.76	-	-	-	-	-	-
27	Bank International Ind	9,887	0.94	-9.57	0.84	-17.20	0.33	-3.59	-	-
28	Bank Permata	9,851	0.61	-3.44	-	-	-	-	-	-
32	Bank IFI	2,572	1.00	2.01	1.00	2.50	1.00	3.84	-	-
Ind	**Regional Full Branch**									
21	Bank Jabar	26,630	1.00	2.82	1.00	1.67	1.00	0.77	0.94	0.21
25	Bank Sumut	15,180	0.52	-1.43	-	-	-	-	-	-
29	BPD Aceh	5,337	0.34	-0.26	-	-	-	-	-	-
30	Bank DKI	4,202	1.00	2.96	0.57	-1.84	-	-	-	-
31	Bank Riau	2,591	0.84	0.87	1.00	N/A	-	-	-	-
33	BPD NTB	1,525	0.62	-2.65	-	-	-	-	-	-
34	Bank Kalsel	1,434	0.67	0.61	-	-	-	-	-	-