

Efficiency of Zakat Institutions and Its Determinants

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Zakat is one of the five basic pillars in Islam. It is an obligation of Muslims to give a specific amount of their wealth (with certain conditions and requirements) to beneficiaries called al-mustahiqqin with the main objective of the achievement of socioeconomic justice. Zakat institutions are trusted bodies that manage zakat in Muslim countries. In Malaysia, such zakat institutions are State Islamic Religious Councils (SIRCs). The institutions are expected to play a key role in promoting the socio-economic objectives of zakat in Malaysia. Thus, it is of prime importance that these institutions are being managed effectively and efficiently. The purpose of this paper is to analyze the efficiency of zakat institutions in Malaysia. This study uses Data Envelopment Analysis (DEA) method to estimate zakat efficiency and Tobit model to determine the efficiency of zakat institutions in Malaysia. We use three different types of DEA model which are technical efficiency (TE), pure technical efficiency (PTE) and scale efficiency (SE) Model. The data consist of a panel of fourteen State Islamic Religious Councils (SIRCs) in Malaysia during the period of 2003 to 2007. Further, Tobit Analysis is utilized in the second stage to determine factors that influence the efficiency of zakat institutions in Malaysia. During the study period, our results suggest that pure technical inefficiency rather than scale inefficiency has resulted in the zakat institutions inefficiency. This could be due to inability of the institutions in using the technology available to collect more zakat collection and distribute it to the recipients. Examination of the return to scale revealed that more than half of zakat institutions in Malaysia were scale inefficient (operating at DRS or IRS). The empirical findings suggest that zakat payment system, computerized zakat system, board size, audit committee and decentralization significantly affect efficiency of zakat institutions in Malaysia.

Keywords: Efficiency, Data Envelopment Analysis (DEA), Zakat Institutions, Malaysia

Introduction

One of the performance measurement system in public sector is efficiency. *Efficiency* deals with both inputs and outputs that measures how productive inputs are turned into outputs. Besides efficiency, there are two other E's that should be measured in public sector organization. The other two E's are *Economy* and *Effectiveness*. *Economy* represents the relationship between resources expended or budgeted for an activity and what is received for them. *Effectiveness* focuses mainly on the outputs that refer to goods and services produced as a direct result of management activities. The additional measure of performance is *outcomes* that refer to the consequences of the output produced (Abdul Rahman, 2007 with a reference to Schacter (1999)).

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In this study, efficiency of zakat institutions will be evaluated as one of the performance measurement system.

In Malaysia, such zakat institutions are State Islamic Religious Councils (SIRCs). The institutions are expected to play a key role in promoting the socio-economic objectives of zakat in Malaysia. Thus, it is of prime importance that these institutions are being managed effectively and efficiently. Being a public service organization which is accountable to the stakeholders and Muslim public at large, these zakat institutions have been subjected to intense public scrutiny and criticism. cursory examination would indicate many parties questioning the efficiency and effectiveness of these institutions in managing zakat affairs of their respective states. Given this continuously arising public concern, it is important to examine the efficiency of these zakat institutions. This paper can be considered as the first systematic attempt to examine the efficiency of zakat institutions in Malaysia. The structure of this paper is as follows. The next section provides some literature on zakat and efficiency. Section 3 discusses the methodology and input-output specification. Section 4 reports the findings and the last section concludes.

Some Related Studies

In Malaysia, all aspects pertaining to the administration of zakat are under the jurisdiction of the states through the SIRCs. There are a total of fourteen SIRCs, one for each of the thirteen states and one for the federal territory. Due to the demand of more efficient and effective collection and distribution of zakat funds in Malaysia, some of the Religious Councils have corporatized an institution that responsible on the matter of collection (and distribution) part of zakat in those particular states. Eight Religious Councils have so far corporatized, starting with *Pusat Pungutan Zakat* (PPZ), Wilayah Persekutuan in 1991, followed by *Pusat Zakat* Selangor, Pahang and Pulau Pinang in 1995, and lastly *Pusat Pungutan Zakat* Negeri Sembilan and Melaka in 2000 (Ahmad *et al.*, 2006). It was followed by *Tabung Baitulmal* Sarawak in 2001 and the latest was *Pusat Zakat* Sabah that has been corporatized in 2007. However, to date, only Selangor, Pulau Pinang, Sarawak and Sabah are fully corporatized (both collection and distribution affairs).

The rise of New Public Management and decentralisation show a transfer of some public services to the private sector and has seen to be more effective and contributed to a decline in the traditional ethos of the public sector (Brereton & Temple, 1999). The decentralisations of the Islamic religious councils showed a transfer of authority or decentralization of the chairman of the councils from Sultan to the state government (*Menteri Besar* or Chief Minister) and further delegation to the other than the Chief Minister. To date, the religious councils of Perak, Kelantan, Perlis and Pahang are still chaired by the Sultan, while Terengganu, Melaka and Negeri Sembilan have decentralized the authority of the religious councils to the Chief Minister. The remaining religious councils were further decentralized to other than Sultan and the Chief Minister.

Most studies conducted on zakat in Malaysia concentrates on various areas including theoretical (Mujitahir, 2003; Tarimin, 1995), legal and compliance (Idris *et al.*, 2003; Ahmad, 2004), accounting (Abdul Rahman, 2003; Ismail & Sanusi, 2004) and Muslim awareness and payment behaviour (Nor *et al.*, 2004; Ahmad *et al.*, 2005; Idris & Ayob, 2002). However, there are very few studies that examined the performance of zakat institutions. Some studies focused on the performance of zakat collection and distribution (Noor *et al.*, 2005) and some other studies measure the impact of privatisation on the performance of zakat institutions (Nor Ghani *et al.*, 2001; Ahmad *et al.*, 2005). It can be seen that there is no study which comprehensively examining the efficiency of Malaysian zakat institutions

In terms of efficiency, economic efficiency is defined in economic theory as a term describing how well a system is performing, in generating the maximum desired output for given inputs with available technology. Efficiency is improved if more output is generated without changing inputs. An economic system is more efficient if it can provide more goods and services for society without using more resources. Studies on efficiency of financial institutions have also been extensively undertaken especially in the banking sector. Sufian (2006), Hassan (2006), Tahir, Bakar & Haron (2009), Sufian & Habibullah (2010), Maamor & Ismail (2010) are among the recent studies undertaken on financial institutions.

In terms of efficiency of public sector organization, there is still lack of studies undertaken on the efficiency of public sector organization in Malaysia. Husain, Abdullah & Kuman (2000) and Ibrahim & Md. Salleh (2006) are among studies that explores the efficiency of public sector in Malaysia. Husain, Abdullah & Kuman (2000) that studied the efficiency of Road Transport Department (RTD) using Data Envelopment analysis (DEA) found out that out of 46 service units, only 11 service units score above 50% of efficiency scores. Ibrahim & Md. Salleh (2006) for instance, in their studies of local governments in providing local public goods and services, found that the overall result showed that most of the local governments in Malaysia are cost inefficient, and that municipality councils were more inefficient than the district councils. Despite the limitation, this study tries to explore the efficiency of zakat institutions in Malaysia and identify the factors affecting the efficiency.

Methodology

Data Envelopment Analysis

The term Data Envelopment Analysis (DEA) was first introduced by Charnes *et al.* (1978), (hereafter CCR), to measure the efficiency of each Decision Making Units (DMUs), that is obtained as a maximum of a ratio of weighted outputs to weighted inputs. This denotes that the more the outputs produced from given inputs, the more efficient is the production. The weights for the ratio are determined by a restriction that the similar ratios for every DMU have to be less than or equal to unity. This definition of efficiency measure allows multiple outputs and inputs without requiring pre-assigned weights. Multiple inputs and outputs are reduced to single 'virtual' input and single 'virtual' output by optimal weights. The efficiency measure is then a function of multipliers of the 'virtual' input-output combination.

The CCR model presupposes that there is no significant relationship between the scale of operations and efficiency by assuming constant returns to scale (CRS) and it delivers the overall technical efficiency (OTE). The CRS assumption is only justifiable when all DMUs are operating at an optimal scale. However, firms or DMUs in practice might face either economies or diseconomies of scale. Thus, if one makes the CRS assumption when not all DMUs are operating at the optimal scale, the computed measures of technical efficiency will be contaminated with scale efficiencies.

Banker *et al.* (1984) extended the CCR model by relaxing the CRS assumption. The resulting "BCC" model was used to assess the efficiency of DMUs characterized by variable returns to scale (VRS). The VRS assumption provides the measurement of pure technical efficiency (PTE), which is the measurement of technical efficiency devoid of the scale efficiency (SE) effects. If there appears to be a difference between the TE and PTE scores of a particular DMU, then it indicates the existence of scale inefficiency.

The input oriented DEA model with VRS technologies can be represented by the following linear programming problem:

$$\begin{aligned}
 & \min \varphi, \lambda, \varphi \\
 & \text{subject to } -\varphi y_i + Y\lambda, \geq 0 \\
 & x_i - X\lambda \geq 0 \\
 & N1' \lambda = 1 \\
 & \text{and } \lambda \geq 0
 \end{aligned} \tag{1}$$

where λ is an $N \times 1$ intensity vector of constants and φ is a scalar ($1 \geq \varphi \leq \infty$). $N1$ is an $N \times 1$ vector of ones. For N number of firms, y_i and x_i are the $M \times N$ and $K \times N$ output and input vectors, respectively. Y comprises the data for all the N firms. Given a fixed level of inputs for the i th firm, the proportional increase in outputs to be achieved the firm indicated by $\varphi - 1$. Note that without the convexity constraint $N1' \lambda = 1$, equation (1) becomes a DEA model with CRS technology. The convexity constraint implies that an inefficient firm is benchmarked against firms of a similar size and therefore the projected point of that firm on the DEA frontier will be a convex combination of observed firms. In other words, each firm would produce on or to the right of the convex production possibility frontier. If TE scores for a particular firm with or without the convexity constraint imposed are the same, then the firm is operating under CRS. If these scores are different, the firm operates under VRS technology. However, in such a case, it would be necessary to identify whether the firm or the DMU operates with IRS or DRS. To do this, assumption of non-increasing returns to scale (NIRS) is imposed in (1) and the convexity constraint $N1' \lambda = 1$ is substituted with $N1' \lambda \leq 1$. This is given as follows:

$$\begin{aligned}
 & \min \varphi, \lambda, \varphi \\
 & \text{subject to } -y_i - Y\lambda, \geq 0, \\
 & \varphi x_i - X\lambda \geq 0, \\
 & N1' \lambda \leq 1 \\
 & \lambda \geq 0
 \end{aligned} \tag{2}$$

Solution of the equation (2) reveals the nature of scale efficiencies. IRS exists if TE score obtained with NIRS technology differs from the TE estimates with VRS technology. If both of these efficiency scores are equal, then the corresponding firm operates with DRS. Because the number of zakat institutions is small, the scope to undertake this study using standard econometric methods is somewhat limited. Amongst the strengths of the DEA is that, DEA is less data demanding as it works fine with small sample size (Canhoto & Dermine, 2003).

The small sample size is among other reasons, which leads us to DEA as the tool of choice for evaluating efficiency of zakat institutions in Malaysia. Furthermore, DEA does not require a preconceived structure or specific functional form to be imposed on the data in identifying and determining the efficient frontier, error, and inefficiency structures of the DMUs (Bauer *et al.*, 1998).

DEA can be used to derive measures of scale efficiency by using the variable returns to scale (VRS), or the BCC model, alongside the constant returns to scale (CRS), or the CCR model. Coelli *et al.* (1998) noted that the BCC model have been most commonly used since the beginning of the 1990s. A DEA model can be constructed either to minimize inputs or to maximize outputs. An input orientation aims at reducing the input amounts as much as possible

while keeping at least the present output levels, while an output orientation aims at maximizing output levels without increasing use of inputs (Cooper *et al.*, 2000).

The standard approach to measuring scale effects using DEA is to run models on both a CRS and VRS basis. Scale efficiency is then found by dividing the efficiency score from the CRS model by the efficiency score from the VRS model. Because the data points are enveloped more tightly under the VRS model, the VRS efficiency scores will be higher and the scale efficiency measures will therefore be in the range 0 to 1. A useful feature of VRS model as compared to the CRS model is that it reports whether a decision-making unit (DMUs) is operating at increasing, constant, or decreasing returns to scale. Constant returns to scale will apply when CRS and VRS efficiency frontiers are tangential with each other; in other words, when the slope of the efficiency frontier is equal to the ratio of inputs to outputs (Cooper *et al.*, 2000). Increasing returns to scale must apply below that level, as the slope of the efficient frontier, which reflects the marginal rate of transformation of inputs to outputs will be greater than the average rate of conversion. Likewise, decreasing returns to scale must apply above the zone in which constant returns to scale apply. DMUs not on the efficient frontier must first be projected onto the efficient frontier before their returns to scale status can be assessed.

Tobit Analysis

To test the determinants of efficiency of zakat institutions in Malaysia, three models of efficiency (TE, PTE and SE) will be tested against the determinants of zakat efficiency. Since the DEA technique produces efficiency scores which are bounded by 0 and 1, hence, it is appropriate to use a limited dependent variable approach, such as Tobit model to perform the multivariate analysis. The possible determinants of the efficiency of zakat institutions are investigated using a random effects³ Tobit model. The definition of each variable is provided in Table 5 (Appendix).

The model is written as:

$$TE_{it} = \beta_0 + \beta_1 NOB_{it} + \beta_2 NOS_{it} + \beta_3 ZPS_{it} + \beta_4 WEB_{it} + \beta_5 CZS_{it} + \beta_6 BS_{it} + \beta_7 MPY_{it} + \beta_8 AC_{it} + \beta_9 DEC_{it} + \beta_{10} CORP_{it} + \mu_{it}$$

$$PTE_{it} = \beta_0 + \beta_1 NOB_{it} + \beta_2 NOS_{it} + \beta_3 ZPS_{it} + \beta_4 WEB_{it} + \beta_5 CZS_{it} + \beta_6 BS_{it} + \beta_7 MPY_{it} + \beta_8 AC_{it} + \beta_9 DEC_{it} + \beta_{10} CORP_{it} + \mu_{it}$$

$$SE_{it} = \beta_0 + \beta_1 NOB_{it} + \beta_2 NOS_{it} + \beta_3 ZPS_{it} + \beta_4 WEB_{it} + \beta_5 CZS_{it} + \beta_6 BS_{it} + \beta_7 MPY_{it} + \beta_8 AC_{it} + \beta_9 DEC_{it} + \beta_{10} CORP_{it} + \mu_{it}$$

Where:

TE, PTE, SE	: Technical efficiency, pure technical efficiency and scale efficiency computed from the DEA model
NOB	: Number of branches
NOS	: Number of staff

³ A random effects model assumed the unobservable effects are uncorrelated with the observed explanatory variables, whereas a fixed effects model assumes that they are correlated. In the context of a Tobit model, the statistical package Stata only provides the random effects option. This is because the fixed effects cannot be conditioned from the likelihood, and unconditioned fixed effects estimates are biased.

ZPS	: Zakat payment system
WEB	: Website
CZS	: Computerized zakat system
BS	: Board size
MPY	: Meeting per year
AC	: Audit committee
DEC	: Decentralization
CORP	: Corporatization

Data and Inputs-Outputs Definition

For the purpose of this study, the efficiency of fourteen DMUs will be examined during the period of 2003-2007. The production approach⁴ is chosen in defining the inputs and outputs used in the study whereby zakat institutions are assumed to produce more zakat funds (collecting zakat, and ‘persuade’ more people to pay zakat and distribute it) using *dakwah* and other promotion methods. Since this study is the first attempt in measuring efficiency of zakat institutions, the choices of inputs and outputs for this study are serendipitous and based on the availability of data for analysis. The data used in the analysis are different in units of measurement (some are in terms of Ringgit Malaysia such as total expenditure, total collection and total distribution, while the others are in terms of real number). Avkiran (1999) acknowledges the edge of the DEA by stating that the technique allows the researchers to choose any kind of inputs and outputs of managerial interest, regardless of different measurement units and there is no need for standardization. Table 1 displays the descriptive statistics of the inputs and outputs employed in this study.

Table 1
Descriptive Statistics of Inputs and Outputs of the SIRC, 2003-2007

	Mean	Median	Maximum	Minimum	Std. Dev.
Input					
No. of staff	127	100	461	22	91
Total Expenditure	37,742,331	25,727,861	214,767,671	1,957,135	42,735,550
Output					
Total collection	42,079,560	27,771,981	202,193,541	5,102,537	42,224,646
Total distribution	32,111,273	20,392,516	174,520,057	3,036,304	34,232,324
No. of zakat payers	304,079	62,408	2,100,562	1,482	505,887

⁴ There are mainly two approaches in defining inputs and outputs especially in the banking sector, ie. the production approach and intermediation approach. Under the production approach, an institution is defined as a producer. The intermediation approach on the other hand, assumes that a DMU acts as an intermediary.

The choice of inputs and outputs in this study is essentially determined by data availability. Three outputs and two inputs are considered for this study to investigate efficiency of 14 SIRC's in Malaysia for the period of 2003 to 2007. The outputs are total collection of zakat, total distribution of zakat and total number of zakat payers, while the inputs are number of staff and total expenditure. Data was collected from the multiple years of Annual report of PPZ Kuala Lumpur⁵, particularly for the data of zakat collection, distribution and zakat payers. As for the data of number of staff and total expenditure, both data were collected from the office of the SIRC's and Zakat Center in Malaysia. Based on Table 1, of all 14 SIRC's, on the average, there is a wide range between the minimum and the maximum amount of inputs used and outputs produced by zakat institutions in Malaysia. This situation happened due to the differences in the state's area in Malaysia. For instance, Perlis, the smallest state in Malaysia should be using less inputs rather than a wide area state like Pahang. The state of Selangor is found to have the highest figure for most variables used since the state of Selangor is the largest concentration of Muslim population in Malaysia with 16.75% of Muslim population in 2007 (Department of Statistics Malaysia, 2010). On the other hand, the state of Perlis is found to have the lowest value of outputs and inputs, simply due to the fact that the state of Perlis is the smallest state in Malaysia with the smallest Muslim population in the country (which recorded only 1.21% of total Muslim population in 2007)(Department of Statistics Malaysia, 2010).

Empirical Results

In this section, the results of technical efficiency (TE), and its decomposition into pure technical efficiency (PTE) and scale efficiency (SE) components are presented. The efficiency is examined first by employing the DEA method for each year under investigation. To substantiate the results under the DEA approach, a random-effect Tobit model is employed to relate the efficiency scores with its determinants.

Efficiency of zakat institutions in Malaysia

Table 2 displays the mean technical, pure technical and scale efficiency score of zakat institutions in Malaysia for the years 2003 (Panel A), 2004 (Panel B), 2005 (Panel C), 2006 (Panel D) 2007 (Panel E) and all years (Panel F).

⁵ PPZ Kuala Lumpur has taken its own initiative in combining data of zakat of all zakat institutions in Malaysia.

Table 2
Summary statistics of efficiency scores (TE, PTE and SE)

Years/Types of Efficiency	Mean	Min	Max	SD
<i>Panel A: 2003</i>				
TE	0.810	0.325	1.000	0.223
PTE	0.845	0.462	1.000	0.205
SE	0.950	0.704	1.000	0.084
<i>Panel B: 2004</i>				
TE	0.828	0.363	1.000	0.199
PTE	0.882	0.518	1.000	0.178
SE	0.933	0.680	1.000	0.089
<i>Panel C: 2005</i>				
TE	0.812	0.337	1.000	0.227
PTE	0.834	0.389	1.000	0.229
SE	0.959	0.752	1.000	0.075
<i>Panel D: 2006</i>				
TE	0.802	0.336	1.000	0.210
PTE	0.857	0.464	1.000	0.193
SE	0.928	0.724	1.000	0.079
<i>Panel E: 2007</i>				
TE	0.779	0.331	1.000	0.224
PTE	0.874	0.515	1.000	0.182
SE	0.880	0.643	1.000	0.127
<i>Panel F: All years</i>				
TE	0.806	0.325	1.000	0.211
PTE	0.861	0.389	1.000	0.192
SE	0.929	0.643	1.000	0.094

Based on table 2, the TE score of zakat institutions are found to be the highest in 2004 (0.828), while in 2007, TE score of zakat institutions is the lowest (0.779). Similarly the PTE score is also found to be the highest in 2004 (0.882), but 2005 is the lowest PTE year score (0.834). However, based on the results, the efficiency score of zakat institutions in Malaysia does not change much over years. Hence, the concern of the differences between efficiency score of different zakat institutions should be paid more attention as the results between the minimum and the maximum score of zakat institutions are even bigger than its differences between years. Another interesting results that should be of concern is the higher results of SE compared to PTE which suggest that efficiency of zakat institutions in Malaysia may be due to the scale or size of the institutions rather than its technical aspect. The results show that pure technical inefficiency dominates scale inefficiency of Malaysian zakat institutions. In other words, it shows that zakat institutions in Malaysia relied more on its size of operation in gaining efficiency.

We now turn our discussion on the developments of the returns to scale of zakat institutions in Malaysia. The following Table 3 displays the results of developments in returns to scale of zakat institution in Malaysia.

Table 3
Returns to scale in zakat institutions in Malaysia

	2003		2004		2005		2006		2007	
	No. of ZIs	% Share	No. of ZIs	% Share	No. of ZIs	% Share	No. of ZIs	% Share	No. of ZIs	% Share
CRS	6	42.9	5	35.7	8	57.1	5	35.7	5	35.7
DRS	6	42.9	8	57.1	2	14.3	9	64.3	9	64.3
IRS	2	14.2	1	7.2	4	28.6	0	0	0	0
Total	14	100	14	100	14	100	14	100	14	100

Table 3 displays the results of zakat institutions returns to scale. As the table shows, over the five periods, the zakat institutions were experiencing a U-shape trend of inefficient zakat institutions, from 67.2% in 2003 and 64.3% in 2004, to 42.9% in 2005 before it rose up to 64.3% in 2006 and 2007. It is apparent from the table that, the number of zakat institutions experiencing economies of scale (IRS) has decreased substantially from 2 (14.3%) in year 2003 to none (0%) in 2006 and in 2007, after it rose up to 4 (28.6%) in 2005. In contrast, zakat institutions that are experiencing diseconomies of scale (DRS) dominate the inefficient zakat institutions in all years except in 2005. For instance, in year 2003, there were 6 (42.85%) zakat institutions experiencing diseconomies of scale and it rose up to 8 (57.1%) in 2004 and 9 (64.3%) in 2006 and 2007 before it declined to 2 (14.3%) in 2005. The share of scale efficient zakat institutions (operating at CRS) on the other hand, are quite stable, where the share of efficient zakat institutions has increased from 6 (42.85%) in year 2003 to 8 (57.1%) in year 2005 before it declined to 5 (35.7%) in year 2007. Hence, there are a lot of improvements should be undertaken by zakat institutions to improve overall efficiency if scale inefficiency resulted from the scale inefficient institutions could be undertaken.

The Determinants of Zakat Efficiency

The regression results focusing on the relationship between zakat efficiency and the explanatory variables are presented in Table 4. In this section, the determinants of efficiency of zakat institutions are tested against the TE, PTE and SE of zakat institution in Malaysia.

Table 4
The determinants of TE, PTE and SE

Dependent variables	TE		PTE		SE	
	Coefficient	P> t	Coefficient	P> t	Coefficient	P> t
constant	0.4832	0.031	0.3622	0.164	0.8383	0.000
NOB	0.0089	0.230	0.0120	0.133	0.0041	0.187
NOS	-0.0013	0.012**	-0.0003	0.672	-0.0008	0.000***
ZPS	0.0668	0.009***	0.1287	0.001***	0.0168	0.095*
WEB	0.1183	0.197	0.0518	0.610	0.0670	0.079*
CZS	-0.3104	0.007***	-0.4791	0.001***	-0.0523	0.248
BS	0.0188	0.092*	0.0202	0.094*	0.0058	0.217
MPY	-0.0074	0.737	0.0189	0.467	-0.0108	0.255
AC	-0.0606	0.522	0.2528	0.041*	-0.1138	0.006***
DEC	0.3708	0.001***	0.1243	0.025*	0.2279	0.000***
CORP	-0.1846	0.050	-0.1397	0.200	-0.0626	0.116
sigma	0.2314		0.2247		0.0947	

NOB: Number of branches available; NOS; Number of staff; ZPS: Total zakat payment system offered; WEB: Dummy of operational website; CZS: Dummy of computerized zakat system; BS: Board size; MPY: Meeting per year; AC: Audit committee; DEC: Decentralization; CORP: Corporatization.

***, ** and * represent significance at 0.01 percent, 0.05 percent and 0.10 percent respectively.

Table 4 shows the determinants of TE, PTE and SE of zakat institutions in Malaysia. Based on TE category, all variables have a positive relationship with TE except NOS, CZS, MPY, AC and PRIV. However, only number of staff (NOS), zakat payment system (ZPS), computerized zakat system (CZS), board size (BS) and decentralization (DEC) are found significantly affect TE of zakat institutions. In terms of PTE category, all variables positively affect PTE of zakat institutions except NOS, CZS and CORP and only ZPS, CZS, BS and AC are found significant in determining PTE of zakat institutions. Differently, all variables are found to have a positive relationship with SE except NOS, CZS, MPY, AC and PRIV, but only NOS, ZPS, WEB, AC and DEC are significant in determining the SE of zakat institutions in Malaysia.

Branch network may facilitate the geographical constraint of some wide area of states in Malaysia. As anticipated, it appears that the coefficient of NOB is positive. Although the results are not statistically significant at any conventional levels, the results imply that the extension of branch network to collect and distribute zakat funds, although may increase the costs, however, the increase in outputs (zakat collection and distribution) gathered dominates the increase in inputs used. Selangor, Perak and Kedah for instance, are the leading institutions in providing

higher number of branches in the respective states. This probably due to the wide area of the state and those states are also among the highest concentration of Muslims. Hence, the extension of branches into a local committee may ease the amil to collect zakat as the local area of zakat management has become narrower. Hence, the branch may also provides the citizens with the needs they desire.

A negative and significant coefficient of NOS suggests that a higher number of staff may not consequently increase the efficiency of zakat institutions in Malaysia. Comparing the results with those in the literature, several possible reasons may explained the results. A large number of people in an organization tend to diminish efficiency as it may results in delays (Keen, 1991) and increase complexity (Ginn & Barlog, 1994). Large number of people involved in a process of an organization may affect the process efficiency (see Arveson, 1999) whereby the bureaucratic processes which add no value to an organization nor to the customer tend to add inefficiencies (Zaheer et al., 2008). Such results indicate that, in order to improve its efficiency, zakat institutions do not necessarily need to hire more staff with unnecessary number of staff. However, the quality and qualification of staff should be paid more attention by the institutions.

Under the variable of technology, three proxies of technology were used to determine the efficiency of zakat institutions in Malaysia. The proxies are total zakat payment used by the institutions, existence of operational website and existence of computerized zakat system. In theory, the use of technology may benefit the applicant in terms of work efficiency, easy to use and many more. However, in this study, the existence of operational website and computerized zakat collection system are found insignificant in affecting the efficiency of zakat institutions in Malaysia (although the results of existence of website are consistent to positively improve the efficiency of zakat institutions).

Perhaps the most important finding is the positive and significant coefficient of modes of zakat payment used, which suggests that the more zakat payment system offered by zakat institutions, the more efficient the institutions. An improvements in technology especially in collecting zakat funds has widely been used by a higher-technology applicants especially in urban states like Selangor and Kuala Lumpur. For instance, Selangor, the state that offers the highest number of zakat payment system, ease the zakat payers to pay zakat online. A total of 11 zakat payment system were offered in Selangor, including the internet banking, short-messages-services (SMS), ATM machine, kiosk machine, credit card, phone-banking and e-debit system. Furthermore, people in Kuala Lumpur and Selangor can also be considered as the most technology-literate in Malaysia. Hence, zakat collection and distribution in Selangor is among the highest in Malaysia.

Board of directors have a number of important responsibilities including hiring and overseeing management team, setting major policies and objectives and participating in the significant decisions within their organization. Thus, board of directors play a key role in setting the policies under which management operate, and board decisions have a significant influence on an organization's performance (Hsu & Petchsakulwong, 2010). Based on the results of the Tobit regression model, the variable BS is found to be positively associated with efficiency of zakat institutions in Malaysia. Although the results are found to be insignificant that could be due to subjectivity, consistent with Abor et al. (2008), Huang et al. (2008) and Hsu & Petchsakulwong (2010), it indicates that more knowledge backgrounds and more varied opinions (provided by a larger board), to a certain extent lead to increase efficiency of an organization. A high number of knowledgeable zakat directors with diversity of perspectives, backgrounds, expertise and experience within the board are important in making important decisions to

improve the efficiency and further the attainment of the objectives and goals of the institutions. Perhaps the variable of professionals on board may be more beneficial to be evaluated in order to complement the results. Professionals on board may be more beneficial than its size as they have outstanding experience and knowledge that can improve the efficiency of the institutions. However, due to the unavailability of data, this variable has to be taken out from the analysis.

The effectiveness of a board also depends on its diligence. However, since board diligence is not directly observable, board meeting frequency is often used as a proxy for board diligence (Hsu & Petchsakulwong, 2010). Studies in corporate sectors showed that higher frequency of board meetings may positively affect the efficiency of an organization (Vafeas, 1999 and Evans *et al.*, 2002) as it help the firm to improve operating performance. In contrast, it may negatively affect the efficiency of an organization (Rebeiz & Salameh, 2006 and Salim *et al.*, 2010).

In this study, the variable meeting per year (MPY) was found to be negatively associated with the efficiency of zakat institutions in Malaysia. Consistent with Rebeiz & Salameh (2006) and Salim *et al.* (2010), the frequency of board meeting is found to be not significant in improving the efficiency of zakat institutions. A large number of meetings per year may also suggest that the board is not properly use meetings to develop policies that may contribute to the efficiency of the organization. Hence, it is suggested that the frequency of the board meeting is less important than its quality, implying that, in order to improve the efficiency of zakat institutions, the decision and action taken in and after the meetings may be more important than its frequency.

From the traditional functional perspective, the aim of auditing is to increase efficiency or financial or administrative accountability of an organization based on the written rules and regulations of the said organization. (Boerhannoeddin *et al.*, 2004). Audit committee is defined as a group of individuals responsible for reviewing and monitoring all internal and external audit functions of an organization. An audit committee is established to oversee the financial reporting process including (but not limited to) supervising internal auditors, monitoring internal controls and ensuring adequate compliance with the standards. Since the committee reports to the board of directors, they have to be independent. Nonetheless, while other studies explore other dimensions of audit committee such as its size, audit committee diligence and financial expertise on the audit committee (see Hsu & Petchsakulwong, 2010), this study investigated the effect of existence of audit committee in the management of zakat institutions in Malaysia. Surprisingly, in this study, the existence of an audit committee (AC) is found to be negatively associated with the efficiency of zakat institutions in Malaysia. It may suggest that the existence of audit committee may not consequently improve the efficiency of zakat institutions. However, this result is probably attributed to the limited number of audit committee in existence in zakat institutions in Malaysia during the study period. The audit committee is still relatively new in the zakat institutions. During the study period, there were only five zakat institutions in Malaysia (as for 2007) which have established audit committee in their organization.

Under corporatization, zakat institutions have implemented innovations and new approaches such as setting up a special unit on research and development, public relations, promotions and internal audit; the use of computers and information technology in zakat affairs and involvement of young and professionals that are not only religious-backgrounded but also those whom have the modern and professional education (Makhtar & Ahmad, 2010). Besides that, other transformations are also innovated by those corporatized institutions in transforming facilities and other methods of zakat payment involving the phonebanking system, using short-

message-services (SMS), internet-banking, auto-teller machine (ATM), credit card, debit card and many more besides more aggressive promotion and publicity through the advertisement, article writing, exhibitions, pamphlets, documentary in electronic and print media and many more (Makhtar & Ahmad, 2010). In terms of zakat distribution, the corporatized zakat institutions have innovated in creating a variety of zakat distribution projects as well as providing an immediate assistance and aid to the recipients (Makhtar & Ahmad, 2010).

With innovation and transformation implemented, corporatized zakat institutions are assumed to be more efficient as compared to the conventional ones. However, surprisingly, the results show that corporatization does not lead to improvement in the efficiency of zakat institutions in Malaysia. This could probably due to the limited number of corporatized institutions whereby there are only three fully corporatized zakat institutions and another four are partially corporatized. Further analysis (Refer Appendix, Table 6) showed that fully corporatized zakat institutions are positively associated with efficiency of zakat institutions in Malaysia while the partially corporatized negatively affect zakat efficiency. These provide evidences that the partially corporatized zakat institutions dominate the effect of corporatization towards the efficiency of zakat institutions in Malaysia due to its larger number than the fully corporatized one. On the other hand, it can be suggested that in order to improve its efficiency, zakat institutions should be fully corporatized as it involves the same pattern of working experience and may lead to input savings with single institution manages both zakat collection and distribution matters .

In terms of organizational structure, the organizational structure of SIRC's in Malaysia has undergone changes since the occurrence of decentralization in 1980s. Decentralization is the process by which decision making responsibilities are transferred from higher level of government to the lower level (Winkler, 2005). Decentralization of zakat institutions showed a transfer of authority ie. chairman of the institutions from the traditional structure of *Sultan/Raja/Yang Dipertua Negeri* to others ie. the state government, or further down to other than the state government. The system may benefit the zakat institutions in terms of attainability of the goals and objectives of the organization as the decentralized authority at the lower level of management and those who are responsive to the local stakeholders of zakat affairs in the particular states.

A consistent results appear in terms of the effect of decentralization (DEC) towards the efficiency of zakat institutions in Malaysia. The positive and significant results of DEC in Table 4 suggest that consistent with Azfar *et al.* (2001) and Barankay & Lockwood (2007), decentralization improves efficiency of an organization as it increased accountability, reducing level of bureaucracy as well as limiting the leakage of funds and other resources. There exist the needs to have the authority who responds to local demand as well as adequate mechanisms for accountability. They are likely to be aware of local preferences which in turn, will be likely to adjust the local demands accordingly. With respect to zakat institutions in Malaysia, the decentralization where the lower level of chairman might have been the person who is responsive to the local stakeholders of zakat affairs in their states as they are those at the same level with the stakeholders of the institutions. For instance, the state of Penang and Sarawak which are among the most efficient zakat institutions are also among the decentralized zakat institutions which was decentralized and chaired by the lower level of chairman (ie. other than *Sultan/ Raja* and the Chief Minister). Compared to Kelantan and Perak which are still maintaining the old organizational structure whereby the *Sultan* (or the acting) chairs the religious council, they are found to be among the least efficient states under this study.

Furthermore, further analysis (see Appendix, Table 7) revealed that two stage decentralization of authority of the chairman of zakat institutions to other than Sultan and the Chief Minister tend to improve the efficiency of zakat institutions. The results could be due to the fact that decentralization further down the organisational hierarchy leads to higher efficiency. The results of this study imply that, in order to improve the efficiency of zakat institutions in Malaysia, the chairman of the institutions should be among the lower level of hierarchy of the management with the right experience and qualifications to chair and lead the councils. They should also be more transparent and accountable in managing the institutions. Furthermore, it also indicates that chairmanship of non-political person and those who have the ability and qualification may also help to improve the efficiency of the institutions.

Conclusion

This paper investigates the efficiency of zakat institutions in Malaysia during the period of 2003-2007. The preferred non-parametric Data Envelopment Analysis (DEA) methodology has allowed us to distinguish between the three different types of efficiency, ie. technical, pure technical and scale efficiency. The results suggest that zakat institutions have exhibited mean technical efficiency of 80.6%. The results also suggest that pure technical inefficiency dominates the scale inefficiency effects in determining technical efficiency of zakat institutions in Malaysia. This implies that a more efficient use of inputs should be paid more attention in order to improve efficiency. In terms of the returns to scale, the results suggest that most zakat institutions were operating at non-CRS. Hence, there are a lot of improvements could be undertaken by zakat institutions to improve overall efficiency if scale inefficiency resulted from the scale inefficient institutions could be undertaken.

The results of the determinants of zakat institutions in Malaysia with three dependent variables (TE, PTE and SE) were tested against ten (10) independent variables. Those variables are number of branches available (NOB); number of staff (NOS); total zakat payment system offered (ZPS); dummy of operational website (WEB); dummy of computerized zakat system (CZS); board size (BS); meeting per year (MPY); Audit committee (AC); Decentralization (DEC); and Corporatization (CORP). Based on the Tobit regression results in the TE category, of the ten (10) variables, five (5) variables were found significantly affect TE of zakat institutions in Malaysia, namely NOS, ZPS, CZS, BS and DEC. However, only DEC have a positive correlation with the efficiency score while the other four (4) have negative correlations.

Meanwhile, in the PTE category, there are all five (5) variables that have significant impacts on zakat efficiency. Variables ZPS, BS, AC and DEC have positive impacts while the variable CZS has a negative impacts on PTE. Furthermore, for SE category, five (5) variables were found significantly affect zakat efficiency. The variables are NOS, ZPS, WEB, AC and DEC. However only ZPS, WEB and DEC have positive impacts on zakat efficiency while the variables NOS and AC are negatively correlated to the zakat efficiency score. From the findings, it can be summarized that only ZPS and DEC are consistently significant in affecting zakat efficiency in Malaysia during the study period. Further studies are required to examine the issues that will provide guidance for the policymakers to improve the efficiency of zakat institutions in Malaysia.

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APPENDIXES

Table 5
Definition and Explanation of Each Variables

Variables	Definition	Hypothesis
Efficiency	Technical efficiency (TE), Pure Technical Efficiency (PTE) and Scale Efficiency (SE) estimated from DEA.	n/a
Decentralization (DEC)	Chairman of the councils, a variable equals to 0 if the council is chaired by the <i>Sultan/Raja/Yang di Pertuan Besar</i> , 1 if chaired by the state government and 2 if chaired by others.	+/-
Board size (BS)	Total number of board of directors.	+/-
Meeting per year (MPY)	Active board of directors measured by number of meetings a year.	+
Audit committee (AC)	Existence of audit committee on every SIRC; takes the value 1 if the committee is exist, or 0 otherwise.	+
Corporatization (CORP)	Functions of SIRC; takes the value 0 if the SIRC is managing the zakat affairs itself, 1 if the SIRC manages the zakat affairs with its subsidiary or 2 if the subsidiary is managing the zakat affairs in the respective state.	+
Number of branches (NOB)	Total number of branches on every state.	+
Number of staff (NOS)	Total number of staff employed in every state.	+
Zakat payment system (ZPS)	Total number of zakat payment system (eg. Using internet-banking, sms, phone-banking, etc) offered by each SIRC.	+
Website (WEB)	Existence of operational website on every SIRC; takes the value 1 if the website is exist, or 0 otherwise.	+
Computerized zakat system (CZS)	Existence of computerized zakat system on every SIRC; takes the value 1 if the system is exist, or 0 otherwise.	+

Table 6
The Tobit regression results of corporatization

Dependent variables	TE			PTE			SE		
	Coefficient	P>	t	Coefficient	P>	t	Coefficient	P>	t
constant	0.8234	0.000***		0.9321	0.000***		0.9476	0.000***	
FCORP	0.2707	0.006***		0.4465	0.002***		0.0677	0.132	
PCORP	-0.0429	0.623		-0.0290	0.785		0.0073	0.860	
sigma	0.2905			0.3398			0.1376		

FPRIV: Fully corporatized; PPRIV: Partially corporatized

*** represents significance at 0.01 percent

Table 7
The Tobit regression results of decentralization

Dependent variables	TE			PTE			SE		
	Coefficient	P>	t	Coefficient	P>	t	Coefficient	P>	t
constant	0.7082	0.000***		0.8272	0.000***		0.8839	0.000***	
OSCM	-0.0772	0.318		-0.1599	0.059**		0.0650	0.144	
OSOTH	0.3788	0.000***		0.4992	0.000***		0.1447	0.001***	
sigma	0.2228			0.2365			0.1274		

OSCM: Decentralized to Chief Minister; OSOTH: Decentralized to others

*** and **represents significance at 0.01 and 0.05 percent respectively