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Efficiency of *zakat* institutions and its determinants

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Abstract - 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 being achievement of socio-economic 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 the data envelopment analysis (DEA) method to estimate zakat efficiency and the 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 the zakat institutions in Malaysia were scale-inefficient (operating at DRS or IRS). The empirical findings suggest that the zakat payment system, computerized zakat system, board size, audit committee, and decentralization significantly affect the efficiency of zakat institutions in Malaysia.

Keywords: efficiency, data envelopment analysis (DEA), zakat institutions, Malaysia

1. Introduction

One of the performance measurement systems in the public sector is efficiency. Efficiency deals with both inputs and outputs and measures how productively inputs are turned into outputs. Besides efficiency, there are two other “E”s that should be measured in a public sector organization: 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 and refers to goods and services produced as a direct result of management activities. The additional measure of performance is outcomes, which refers to the consequences of the output produced (Abdul

Rahman 2007, referring to Schacter 1999). In this study, the efficiency of zakat institutions will be evaluated as one of the performance measurement systems.

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 stakeholders and the Muslim public at large, these zakat institutions have been subjected to intense public scrutiny and criticism. cursory examination would indicate many

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parties questioning the efficiency and effectiveness of these institutions in managing zakat affairs of their respective states. Given this ongoing 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.

2. Literature review

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 for more efficient and effective collection and distribution of zakat funds in Malaysia, some of the Religious Councils have corporatized an institution that is responsible for the matter of collection (and distribution) of part of zakat in those particular states.

Eight Religious Councils have so far been 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). These were followed by Tabung Baitulmal Sarawak in 2001, and the latest is Pusat Zakat Sabah that was been corporatized in 2007. However, to date, only Selangor, Pulau Pinang, Sarawak, and Sabah are fully corporatized (for both collection and distribution affairs).

The rise of New Public Management and de-centralization has shown a transfer of some public services to the private sector and has been seen to be more effective and has contributed to a decline in the traditional ethos of the public sector (Brereton and Temple 1999). The decentralizations 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 those 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 persons other than the Sultan and the Chief Minister.

Most studies conducted on zakat in Malaysia concentrate on various areas including theoretical (Mujitahir 2003; Tarimin 1995), legal and compliance (Idris et al. 2003; Ahmad 2004), accounting (Abdul Rahman 2003; Ismail and Sanusi 2004), and Muslim awareness and payment behaviour (Nor et al. 2004; Ahmad et al. 2005; Idris and Ayob 2002). However, there are very few studies that have 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 has comprehensively examined 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 the 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 the efficiency of financial institutions have also been extensively undertaken especially in the banking sector. Sufian (2006), Hassan (2006), Tahir, Bakar and Haron (2009), Sufian and Habibullah (2010), Maamor and Ismail (2010) are among the recent studies undertaken on financial institutions.

In terms of the efficiency of public sector organization, there is still a lack of studies undertaken on the efficiency of public sector organization in Malaysia. Husain, Abdullah and Kuman (2000) and Ibrahim and Md. Salleh (2006) are among researchers who have explored the efficiency of the public sector in Malaysia. Husain, Abdullah and Kuman (2000) studied the efficiency of the Road Transport Department (RTD) using data envelopment analysis (DEA) and found out that of 46 service units, only 11 service units scored above 50% as an efficiency score. Ibrahim and Md. Salleh (2006), for instance, in their studies of local government provision of public goods and services, found that the overall result was that most of the local governments in Malaysia are cost-inefficient, and that municipality councils are more inefficient than the district councils. Despite limitations, this study attempts to explore the efficiency of zakat institutions in Malaysia, and to identify the factors affecting efficiency.

3. Methodology

Data envelopment analysis

The term “data envelopment analysis” (DEA) was first introduced by Charnes et al. (1978) (“CCR” model), to measure the efficiency of each decision making units (DMU) 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 an efficiency measure allows multiple outputs and inputs without requiring pre-assigned weights. Multiple inputs and outputs are reduced to a 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:

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

where λ is an $N \times 1$ intensity vector of constants and ϕ is a scalar ($1 \geq \phi \geq \alpha$). $N1$ 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 by the firm is indicated by $\phi - 1$. 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, an 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:

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

Solution of equation (2) reveals the nature of scale efficiencies. IRS exists if the 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 and works well with small sample size (Canhoto and Dermine 2003).

It is the small sample size, among other reasons, that leads us to DEA as the tool of choice for evaluating the efficiency of *zakat* institutions in Malaysia. Furthermore, DEA does not require a pre-conceived 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 has been used most commonly 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 the 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 the Tobit model to perform the multivariate analysis. The possible determinants of the efficiency of *zakat* institutions are investigated using a random effects¹ Tobit model. The definition of each variable is provided in Table 5.

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
ZPS	: Zakat payment system
WEB	: Website
CZS	: Computerized zakat system
BS	: Board size
MPY	: Meetings 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 approach² 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 at measuring the 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 differ in terms of 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 researchers to choose any kind of inputs and outputs of managerial interest, regardless of the 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.

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 the efficiency of 14 SIRCs 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’ annual report

of PPZ Kuala Lumpur³, particularly for the data regarding zakat collection, distribution, and zakat payers. As for the data regarding number of staff and total expenditure, these were collected from the office of the SIRCs and Zakat Center in Malaysia. As can be seen from Table 1, of the 14 SIRCs, there is a wide range on average between the minimum and the maximum amount of inputs used and outputs produced by zakat institutions in Malaysia. This situation is due to differences in the area of states in Malaysia. For instance, Perlis as the smallest state in Malaysia should be using less input than a large state like Pahang. The state of Selangor is found to have the highest figure for most variables used since this state is the largest concentration of Muslim population in Malaysia with 16.75% of the 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 it is the smallest state in Malaysia, with the smallest Muslim population in the country at only 1.21% of the total Muslim population in 2007 (Department of Statistics Malaysia 2010).

4. 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, 2004, 2005, 2006, 2007, and all years.

Based on Table 2, the TE scores of zakat institutions are found to be the highest in 2004 (0.828), while in 2007, the 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 year with the lowest PTE score (0.834). However, based on the results, the efficiency score of zakat institutions in Malaysia does not change much over the years studied. Hence, more attention should be paid to the differences between efficiency scores of the different zakat institutions, as the results between the minimum and

Table 1. Descriptive statistics of inputs and outputs of the SIRCs, 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

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

Years/Types of Efficiency	Mean	Min	Max	SD
2003				
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
2004				
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
2005				
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
2006				
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
2007				
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
All years				
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

the maximum score of these *zakat* institutions are bigger than the differences between the years. Another interesting results that should be of concern is the higher results of SE compared to PTE, which suggests that the efficiency of *zakat* institutions in Malaysia may be due to the scale or size of the institutions, rather than to technical aspects. The results show that pure technical inefficiency dominates scale inefficiency of Malaysian *zakat* institutions. In other words, it shows that *zakat* institutions in Malaysia rely more on size of operation in gaining efficiency.

We now turn our discussion to the developments on returns to scale of *zakat* institutions in Malaysia (see Table 3).

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

As shown Table 3, over the five year period the *zakat* institutions were experiencing a U-shaped trend in terms of inefficient *zakat* institutions, from 67.2% in 2003 and 64.3% in 2004, to 42.9% in 2005, before increasing to 64.3% in 2006 and 2007. It is apparent that the number of *zakat* institutions experiencing economies of scale (IRS) decreased substantially from 2 (14.3%) in 2003 to none (0%) in 2006 and in 2007, after increasing 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 for 2005. For instance, in 2003, there were 6 (42.85%) *zakat* institutions experiencing diseconomies of scale and this number rose to 8 (57.1%) in 2004 and 9 (64.3%) in 2006 and 2007, having declined to 2 (14.3%) in 2005. The share of scale efficient *zakat* institutions (operating at CRS) on the other hand, is quite stable, this having increased from 6 (42.85%) in 2003 to 8 (57.1%) in 2005, before it declined to 5 (35.7%) in 2007. Hence, there are many improvements that could be made by *zakat* institutions to improve overall efficiency if scale inefficiency resulting from the scale inefficient institutions could be tackled.

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* institutions in Malaysia.

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 to significantly affect the 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 to be significant in determining PTE of *zakat* institutions. By contrast, 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 networks may facilitate the geographical constraint of some of the larger states in Malaysia. As anticipated, it appears that the coefficient of NOB is positive. Although the results are not statistically significant at any conventional

Table 4. 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: Meetings per year; AC: Audit committee; DEC: Decentralization; CORP: Corporatization.

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

levels, the results suggest extension of the branch networks to collect and distribute zakat funds as, although this may increase the costs, 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 a higher number of branches in the respective states. This is probably due to the wide area of these states, which also have amongst the highest densities of Muslims. Hence, the extension of branches into a local community may ease the collection of zakat as the local area of zakat management will have become narrower, and the branch may also meet the needs of citizens.

A negative and significant coefficient of NOS suggests that a higher number of staff may not lead to a consequent increase in the efficiency of zakat institutions in Malaysia. Comparing these results with others reported in the literature, several possible reasons may explain the results. A large number of people in an organization tend to diminish efficiency as it may result in delays (Keen 1991) and increase complexity (Ginn and Barlog 1994). A large number of people involved in the processes 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, resulting in an unnecessary number of staff. However, the institutions should pay more attention to the quality and qualifications of staff.

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 an operational website, and existence of a computerized

zakat system. In theory, the use of technology may benefit the applicant in terms of work efficiency, ease of use, and many more factors. However, in this study, the existence of an operational website and computerized zakat collection system are found to be insignificant in terms of affecting the efficiency of zakat institutions in Malaysia (although the results regarding the existence of a website are consistent in positively improving 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 systems offered by zakat institutions, the more efficient the institutions. An improvement in technology, especially in collecting zakat funds has been used widely by higher technology applicants, especially in urban states like Selangor and Kuala Lumpur. For instance, Selangor is the state offering the highest number of zakat payment systems and makes it easy for payers to pay zakat online. A total of 11 zakat payment systems were offered in Selangor, including internet banking, short messages services (SMS), ATM machines, kiosk machines, credit card, phone banking, and an e-debit system. Furthermore, people in Kuala Lumpur and Selangor can also be considered to be the most technology-literate in Malaysia. Hence, zakat collection and distribution in Selangor is among the most efficient in Malaysia.

The board of directors has a number of important responsibilities including hiring and overseeing the management team, setting major policies and objectives, and participating in significant decisions within their organization. Thus, the board plays a key role in setting the policies under which management operates, and board decisions have a significant influence on an organization's performance (Hsu and Petchsakulwong 2010). Based on the results of the Tobit regression model, the variable BS is found to be positively associated with the efficiency of zakat institutions in Malaysia. Although the results are

found to be insignificant, this could be due to subjectivity, consistent with Abor et al. (2008), Huang et al. (2008) and Hsu and Petchsakulwong (2010); it indicates that a more knowledgeable background and more varied opinions (provided by a larger board) will, to a certain extent, lead to increased efficiency of an organization. A larger number of knowledgeable *zakat* directors within the board with a diversity of perspectives, backgrounds, expertise and experience are important in making important decisions to improve the efficiency and further the attainment of the objectives and goals of the institutions. Perhaps it may be more beneficial to evaluate the variable of professionals on the board in order to complement the results. The inclusion of professionals on the board may be more beneficial than the size of the board, as they will have particular experience and knowledge that can improve the efficiency of the institutions. However, due to the unavailability of data, this variable has to be removed 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 and Petchsakulwong 2010). Studies in corporate sectors show that a higher frequency of board meetings may positively affect the efficiency of an organization (Vafeas 1999; 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 and Salameh 2006; Salim et al. 2010).

In this study, the variable of meetings per year (MPY) was found to be negatively associated with the efficiency of *zakat* institutions in Malaysia. Consistent with Rebeiz and Salameh (2006) and Salim et al. (2010), the frequency of board meetings 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 using meetings to develop policies that may contribute to the efficiency of the organization. Hence, it is suggested that the frequency of board meetings is less important than the quality, which implies that, in order to improve the efficiency of *zakat* institutions, the decisions and actions taken in and after the meetings may be more important than the frequency of meetings.

From the traditional functional perspective, the aim of auditing is to increase the efficiency or financial or administrative accountability of an organization based on the written rules and regulations of that organization (Boerhannoeddin et al. 2004). An 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 have explored dimensions of the audit committee such as size, audit committee diligence, and financial expertise on the audit committee (see Hsu and Petchsakulwong 2010), this study investigated the effect of the existence of an audit committee in the management of *zakat* institutions in

Malaysia. Surprisingly, 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 an audit committee may not consequently improve the efficiency of *zakat* institutions. However, this result is probably attributable to the limited number of audit committee in existence in *zakat* institutions in Malaysia during the study period. An audit committee is still a relatively new feature in *zakat* institutions. During the study period, there were only five *zakat* institutions in Malaysia (as at 2007) which had established an 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, use of computers and information technology in *zakat* affairs, and the involvement of young people and professionals not only of a religious background but also those with modern and professional education (Makhtar and Ahmad 2010). Besides this, other innovations by corporatized institutions include transforming facilities and other methods of *zakat* payment involving the phone banking system, using short message services (SMS), internet banking, auto teller machine (ATM), credit card, debit card, as well as more aggressive promotion and publicity through advertisements, article writing, exhibitions, pamphlets, documentaries in electronic and print media, and much more (Makhtar and 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 immediate assistance to the recipients (Makhtar and Ahmad 2010).

With innovation and transformation implemented, corporatized *zakat* institutions are assumed to be more efficient than the conventional ones. Surprisingly, however, the results show that corporatization does not lead to improvements in the efficiency of *zakat* institutions in Malaysia. This result is probably due to the limited number of corporatized institutions: there are only three fully corporatized *zakat* institutions and another four are partially corporatized. Further analysis (see 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. This provides evidence that the partially corporatized *zakat* institutions dominate the effect of corporatization towards the efficiency of *zakat* institutions in Malaysia, due to its larger number of these than fully corporatized ones. On the other hand, it may be suggested that, in order to improve efficiency, *zakat* institutions should be fully corporatized as it involves the same pattern of working experience and may lead to input savings with a single institution managing both *zakat* collection and distribution matters.

In terms of organizational structure of SIRC in Malaysia, this has undergone change since the occurrence of decentralization in 1980s. Decentralization is the process by which decision-making responsibilities are transferred from a higher level of government to the lower level (Winkler 2005). Decentralization of *zakat* institutions showed a transfer of authority to the chairman of the

institutions from the traditional structure of Sultan/Raja/Yang Dipertua Negeri to others, that is, to the state government, or further down. This system may benefit the zakat institutions in terms of attainability of the goals and objectives of the organization as the decentralized authority is held at the lower level of management by those who are responsive to the local stakeholders of zakat affairs in the particular states.

Consistent results appear in terms of the effect of decentralization (DEC) on the efficiency of zakat institutions in Malaysia. The positive and significant results of DEC shown in Table 4 suggest that, consistent with Azfar et al. (2001) and Barankay and Lockwood (2007), decentralization improves the efficiency of an organization as it increases accountability, reducing the level of bureaucracy as well as limiting the leakage of funds and other resources. There exists the need to have an 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, this may be decentralization to the lower level of chairman who 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 states of Penang and Sarawak, which are among the most efficient zakat institutions, are also among the decentralized zakat institutions, having been which decentralized and chaired by the lower level of chairman (rather than by the Sultan/Raja and the Chief Minister). By contrast, Kelantan and Perak, which still maintain the old organizational structure whereby the Sultan (or the acting Sultan) chairs the religious council, are found to be among the least efficient states in this study.

Further analysis (see Table 7) revealed that two stage decentralization of authority of the chairman of zakat institutions to someone other than the Sultan and the Chief Minister tends 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 by a non-political person and those who have the ability and qualifications may also help to improve the efficiency of the institutions.

5. 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, that is, technical, pure technical, and scale efficiency. The results suggest that zakat institutions have exhibited a mean technical efficiency of 80.6%. The results also suggest that pure technical

inefficiency dominates the scale inefficiency effects in determining the technical efficiency of zakat institutions in Malaysia. This implies that more attention should be paid to a more efficient use of inputs 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 many improvements that could be undertaken by zakat institutions to improve overall efficiency, if scale inefficiency resulting from the scale inefficient institutions could be tackled.

The results of the determinants of zakat institutions in Malaysia with three dependent variables (TE, PTE and SE) were tested against ten 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); meetings per year (MPY); Audit committee (AC); Decentralization (DEC); and Corporatization (CORP). Based on the Tobit regression results in the TE category, of the ten variables, five variables were found to significantly affect the TE of zakat institutions in Malaysia, namely NOS, ZPS, CZS, BS, and DEC. However, only DEC has a positive correlation with the efficiency score, while the other four have negative correlations.

Meanwhile, in the PTE category, all five variables have a significant impact on zakat efficiency. The variables ZPS, BS, AC, and DEC have positive impacts while the variable CZS has a negative impact on PTE. Furthermore, for the SE category, five variables were found to significantly affect zakat efficiency. These 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 with 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 policy makers aiming to improve the efficiency of zakat institutions in Malaysia.

Notes

1. 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.
2. 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.
3. PPZ Kuala Lumpur has taken its own initiative in combining data of zakat of all zakat institutions in Malaysia.

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