

Efficiency and Stability of Zakat Institutions in Malaysia and Indonesia: DEA Window Analysis

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Abstract – The purpose of this study is to measure the efficiency and stability of zakat institutions in Indonesia and Malaysia. There are 14 zakat institutions that will be analyzed using data envelopment analysis (DEA) window analysis during the period of 2016 to 2020. The result shows that the average efficiency of zakat institution is 78% during the observation period. The inefficiency of zakat institutions from both countries is caused by the less-than-optimal distribution of zakat funds. The best performing zakat institutions are Selangor, BSMU, BRI Foundation, and Baznas because they have the highest efficiency and stability. This study has filled the gap in previous studies that measure the efficiency of zakat institutions with the standard DEA approach. Zakat institution managers can identify potential improvements in input and output variables to achieve maximum level of efficiency.

Keywords – Zakat institution, efficiency, stability, DEA, window analysis.

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1. Introduction

Zakat aims to purify wealth of Muslims, as a pillar of Islam that must be done [1], [2], and is used to help people in need [3]. Zakat must be issued to every Muslim who is included in the obligatory zakat requirements. Of the income they get, they are required to spend a portion or at least 2.5% when they reach the nishab (the minimum required wealth for Muslims to fulfill the zakat obligation) [4]. The zakat funds that are collected are distributed to people who are entitled to receive zakat [5]. Therefore, the function of zakat is as an equalization of wealth which is one of the important instruments to reduce poverty in the social environment [6].

The practice of zakat in several countries is almost the same, zakat funds are collected and the government manages it. Zakat is paid to business actors or workers whose assets reach al-nishab (the minimum criterion for the number of assets owned is one year before the zakat is due). Zakat from cash assets, stocks, gold, and business goods which are paid annually to certain recipients, can support a country's economic growth [7]. Zakat can increase the growth of gross domestic product (GDP) in a country [8]. In addition, zakat has a role as a balancer in the economy and can help overcome the problem of poverty in a country [9], [10].

Muslims are required to pay zakat, however, zakat institutions consistently perform considerably below expectations. There are still many Muslims who live below the poverty line which indicates that zakat institutions are not running well [11]. Both receiving zakat funds and allocating zakat funds, zakat institutions face challenges. According to research by [12], zakat makes it easier for mustahiq (in need/poor) to get out of poverty. An effective social fund management program is a solution to alleviate poverty. However, the majority of nation's social security programs are not yet productive [13].

Therefore, there needs to be an institution that can manage zakat from those who provide funds to those who receive funds efficiently to gain public trust and run effectively [14], [15]. The evaluation displays questions from various parties regarding efficiency in managing the zakat funds. Given the public concerns that have arisen, there is still very limited research exploring of the use of zakat funds efficiency.

Research on zakat has focused on administration [16], accounting [17], and fund distribution [18] both theoretically and empirically. Research is also concerned with the relationship between zakat and unemployment [19], [20] or the relationship between zakat and poverty [9], [10], [14]. Most evaluations of zakat funds use a descriptive approach [21], a mathematical model approach [22], and a literature approach [1], [23]. However, research regarding Islamic social finance is still limited [13]. There is no study that evaluates the stability of zakat fund efficiency.

Various studies regarding the growth of zakat are devoted to one country, such as Indonesia [10], [24], Malaysia [22], [25], Algeria [1], Bangladesh [26], and Nigeria [27]. However, they do not compare several countries. Currently, Malaysia is a country that conducts a lot of research on Islamic social finance [13]. In fact, Islamic social finance has the potential to be developed in Indonesia [23], [12]. Thus, this study will use a cross-country approach.

Figure 1. shows the increasing growth of zakat collection in Indonesia and Malaysia in 2014-2020. The average increase each year in Indonesia is 24%, and in Malaysia it is 10%. However, there is still a gap between the collection and distribution of zakat due to the inefficiency of zakat institutions. In Indonesia, this happens because of the low accountability and transparency in the management of zakat funds [28]. Indonesia and Malaysia have similarities, namely the low perception of public awareness and needs in its use to distribute zakat [29].

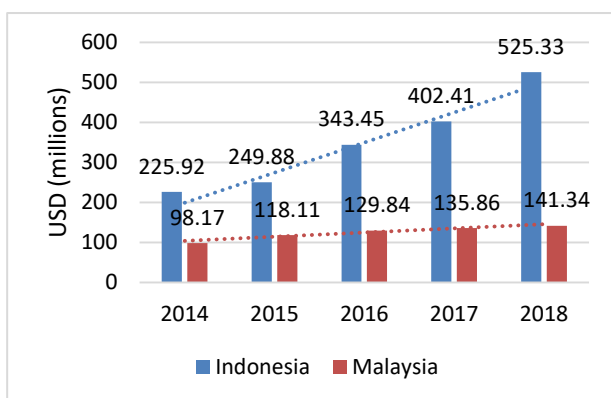


Figure 1. Zakat collection in Indonesia and Malaysia in 2014-2018

Source: Baznas, PPZ MAIWP.

The purpose of this research is to assess the efficiency of zakat funding using data envelopment analysis (DEA) and identify the stability by window analysis. Compare the levels of efficiency and stability in Indonesia and Malaysia. The findings of this study provide substantial implications for improving zakat practices in Malaysia and in Indonesia. Thus, this is the first study that measures the efficiency and stability of zakat institutions in Indonesia and Malaysia. This study is organized as follows. The following section discusses the zakat literature, its efficiency, and output. The third section discusses the process for measuring the efficiency and stability of zakat institutions. The fourth section summarises the findings, and the last section concludes.

2. Literature Review

Signaling theory explains how organizations have incentives to provide information to other organizations. This encouragement is the result of asymmetric information between management and outsiders, in which management is privy to more and more timely internal organizational information than outsiders [30]. The motivation of management to offer information on the handling of zakat funds is expected to send a favorable signal to zakat payers and the general public.

LAZ (Lembaga Amil Zakat) is a state institution that plays a role in collecting and distributing zakat in a country. Zakat management institutions experience changes from time to time. The changes were mainly influenced by the prevailing government policies. In general, the government's policy on zakat shows the expected improvement so that every change becomes more regular and has national reach. Zakat is an order from Allah Subhanahu wa ta'al a-Arabic for "The most glorified, the most high", which is obligatory for those who believe and can afford the assets they have which of course have reached the nishab specified by the conditions aimed solely at purifying themselves and their assets which can be distributed to the allocations set out in the Al-Qur'an.

As one of the pillars of Islam, zakat is mandatory for all muslims who have fulfilled the conditions. Anyone who denies this is considered a disbeliever, and those who refuse to pay zakat will be fought. Therefore, zakat cleanses the soul from greed and avarice.

Zakat is an economic stimulant; therefore, it bolsters the ability to attract substantial investment and promotes higher production in the economic cycle of a region. Even on a macro scale, zakat will be able to enhance aggregate demand since it will increase people's purchasing power.

Making zakat obligatory for both individuals and the government could significantly boost employment opportunities and decrease unemployment.

Efficiency refers to the degree of accomplishment of a task, which is evaluated by the quantity of input utilized or expended to attain the desired output or outcome. Efficiency can be enhanced by producing more output with the same input. In case where financial framework can give more products and administrations to society without devouring extra assets, it is considered more proficient. Most of the previous researches on efficiency have mainly concentrated on cost efficiency [31], [32], [33]. However, researches by [34], [35] showed that inefficient income also influences the efficiency of an institution.

The combination of waqf, zakat, alms and community funds can make a significant contribution to community empowerment if managed properly [27]. Furthermore, it is stated in the study [17] indicating that Islamic social financial tools, particularly zakat, infaq, and waqf, might contribute to the economic rehabilitation of the country following the crisis. In addition, Islamic social finance can be utilized to urge Muslim-majority nations to achieve sustainable development goals (SDGs) based on maqasid sharia [36].

Paper [37] analyzes the efficiency of Algeria's zakat fund management. The analysis revealed that despite the fund's effectiveness in assisting a large number of recipients, the results have been inefficient relative to the fund's potential. This concludes the importance of efficiency in the zakat institution. The governance practices of Malaysian zakat institutions show an increase in efficiency [22]. Zakat institutions in Indonesia have also experienced an increase in efficiency [38]. Developing zakat institutions in Indonesia requires greater accountability and openness in the administration of zakat funds. Indonesia's accumulation and distribution of zakat payments can be increased by implementing suitable resource management strategies [28].

Previous researchers said Islamic finance is a social responsibility based on ethical and moral relationships [39]. However, there is still very limited research that measures or assesses the social component of Islamic finance. Previous research on Islamic social finance predominantly uses a theoretical approach [13]. There is still very limited research that comprehensively measures the efficiency of zakat funds from various countries. Malaysia and Indonesia are countries that have a large role in collaborative zakat research [40]. Effectiveness in collecting and distributing zakat in Indonesia and Malaysia has been proven to reduce the level of poverty.

This country has become a model for many other countries in managing zakat [41].

Indonesia has more Muslim population than Malaysia, but the zakat collection in Indonesia is still far below Malaysia. According to data from the Indonesian National Amil Zakat Agency (BAZNAS), only about 0.23% of the population pays zakat, while in Malaysia more than half of the Muslim population pays zakat through legitimate zakat institutions.

Based on previous studies, it has been found that studies that discuss the performance of zakat institution efficiency are conducted using data envelopment analysis method [1], [38], [28]. However, DEA measurement has been modified to produce a more robust measurement, one of which is the DEA window analysis method. Measurement consistency can be overcome by measures such as Long Distance per Year (LDY), Long Distance per Window (LDW), Long Distance per all Period (LDP), and standard deviation (SD). Therefore, this study has filled the gap by conducting DEA window analysis on zakat institutions in Indonesia and Malaysia covering the period 2016 to 2020.

3. Methodology

This study analyzes the efficiency and stability of 14 zakat institutions using DEA with a window-based approach. The sample of this research is zakat institutions that publish complete financial statements during the observation period 2016 to 2020. Furthermore, the same number of samples from each country is selected to conduct a difference test. Table 1 describes the list of zakat institutions that are sampled in this study.

DEA is a quantitative research methodology used to estimate the relative efficiency of a business unit in using its resources. DEA with linear mathematical techniques can compare between units that have different inputs and outputs [42]. Efficiency is measured by analyzing the inputs and outputs variables. Zakat collection and zakat fund expenditure are the inputs variables measured in this study. The output of this research is a distribution of alms or zakat.

The Banker Charnes Cooper (BBC) or Variable Return to Scale (VRS) approach is used in this research namely, the increase in input and output is not constant. The increase in inputs and outputs is not always proportional but can increase or decrease. This approach will produce an efficiency value for each zakat institution as measured by the DEA method. DEA provides efficiency results in the form of an efficiency ratio between the output produced and the input used by a unit.

The results from the DEA analysis can be used to identify efficient and inefficient units and provide insights to improve operational efficiency. This analysis can help management develop strategies to improve business efficiency.

The formula for the BCC model is as follows:

$$\text{Efficiency score of DMU } i = \frac{\sum_{j=1 \text{ to } n} \lambda_j y_j / u_j}{\sum_{k=1 \text{ to } m} \lambda_k x_{ik} / v_{ik}}$$

- Efficiency score of DMU *i* is the ratio of weighted outputs to weighted inputs for DMU *i*
- *n* is the number of DMUs
- *m* is the number of inputs
- *y_j* is the output of DMU *j*
- *x_{ik}* is the input *i* of DMU *k*
- λ_j and λ_k are the weights assigned to each DMU
- *u_j* and *v_{ik}* are the scaling factors that adjust for variable returns to scale

In the second stage, window analysis was conducted. This analysis provides an overview of efficiency stability through several summary statistics, namely Long Distance Per Year (LDY), Long Distance per Window (LDW), Long Distance per all Period (LDP), and standard deviation (SD) [43].

LDY is the most substantial indicator that shows the level of stability of each zakat institution studied. LDW is an indicator that shows the most significant difference of each efficiency score in one window in each zakat institution. LDP is an indicator that shows the most significant difference of each efficiency score from all years observed in the whole window of each zakat institution. The smaller the LDY, LDW, and LDP scores, the more stable the efficiency achieved by each zakat institution, and vice versa.

Mean is the average value of the efficiency scores generated from all years observed within the whole window owned by the zakat institution. Meanwhile, standard deviation is the deviation value that measures the difference in the average efficiency level of zakat institution for each window, the smaller the standard deviation shows the more stable the efficiency level of zakat institution.

Table 2. Descriptive statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Output 1: Zakat distribution (ZD)	70	1172345.79	167501684.02	26278007.57	36061868.98
Input 1: Zakat Collection (ZC)	70	1131280.45	200850439.46	29934200.89	42456167.09
Input 2: Zakat fund Expenses (ZE)	70	123758.46	25106304.96	3794124.43	5313141.27
Efficiency	70	0.41	1.00	0.84	0.13

This research uses an intermediation approach that assumes that zakat institutions act as intermediaries between the zakat fund payers and the zakat fund recipients. The intermediation approach measures the ability to manage zakat funds in distributing zakat funds. The quotation/total amount of zakat collection (ZC) money; and amil expenses, namely zakat expenditure (ZE), are the input data in this study. In Indonesia and Malaysia, the output used to assess zakat efficiency is the distribution/total amount of zakat distribution (ZD).

Table 1. List of the selected zakat funds in Indonesia and Malaysia

Decision Making Unit	Zakat Institution
DMU1 (Indonesia)	Baznas
DMU2 (Indonesia)	BRI Foundation
DMU3 (Indonesia)	BSMU
DMU4 (Indonesia)	Dompot Duafa
DMU5 (Indonesia)	Dewan Dakwah
DMU6 (Indonesia)	Rumah Zakat
DMU7 (Indonesia)	Rumah Yatim Ar Rohman
DMU8 (Malaysia)	Kedah
DMU9 (Malaysia)	Pulau Pinang
DMU10 (Malaysia)	Terengganu
DMU11 (Malaysia)	Melaka
DMU12 (Malaysia)	Sabah
DMU13 (Malaysia)	Selangor
DMU14 (Malaysia)	Pahang

4. Results and Discussion

Table 2 shows the total inputs, outputs, and efficiency values, for all zakat institutions in Indonesia and Malaysia period 2016 to 2020.

The mean, median, standard deviation, minimum value, and maximum value of each indicator in this study are shown in Table 2. The number of samples is 70 consisting of 14 zakat institutions during the period 2016–2020. The inputs used in measuring the efficiency of zakat institutions consist of zakat collection, zakat fund expenses. The output used is zakat distribution.

4.1. The efficiency of Zakat Institutions in Indonesia and Malaysia

Based on the calculation result of DEA method with VRS assumption on intermediation approach using DEAP 2.1 Software, it can be seen the efficiency score of zakat institution in Indonesia and Malaysia in Table 3. The zakat institution with the highest score in Malaysia is Selangor with 94%. Dewan dakwah has the highest efficiency score in Indonesia which is 88%. BSMU is the zakat institutions that mostly achieve 100% efficiency during the observation period.

The average efficiency of zakat institution is 78%. Zakat institutions in Indonesia that achieved above average efficiency score during the observation year are BRI Foundation, BSMU, and Dewan Dakwah. In addition, in Malaysia there are Terengganu, and Selangor zakat institutions.

Meanwhile, zakat institutions that have the lowest efficiency score in Malaysia and Indonesia are Melaka with 64%, Rumah Yatim Ar Rohman with 75,6%. The inefficiency of zakat institution in Indonesia and Malaysia is caused by the non-achievement of the target of zakat revenue and distribution from the zakat institution. The distribution of zakat is still not optimal, the effectiveness of the use of zakat funds is still low, and the management costs are high.

Table 3. Zakat institution efficiency in Indonesia and Malaysia

DMU	Score					Mean
	2016	2017	2018	2019	2020	
Baznas	0.57	0.71	0.99	0.76	0.76	0.76
BRI	0.73	0.61	1.00	0.95	0.85	0.83
BSMU	0.41	1.00	1.00	1.00	0.82	0.85
D. Duafa	0.82	0.68	0.77	0.79	0.68	0.75
D.Dakwah	1.00	0.89	0.84	0.97	0.70	0.88
R.Zakat	0.73	0.77	0.74	0.83	0.72	0.76
RYA	0.94	0.74	0.68	0.71	0.72	0.76
Kedah	0.85	0.82	0.74	0.76	0.75	0.78
P Pinang	0.74	0.80	0.62	0.67	0.69	0.70
Terengganu	0.92	1.00	0.91	0.87	0.73	0.89
Melaka	0.73	0.62	0.68	0.66	0.52	0.64
Sabah	0.73	0.62	0.69	0.64	0.69	0.67
Selangor	0.98	0.75	1.00	1.00	0.99	0.94
Pahang	0.80	0.81	0.74	0.66	0.72	0.75
Mean	0.78	0.77	0.81	0.80	0.74	0.78

Source: DEAP 2.1

With the intermediation approach, several zakat institutions experience the inefficiencies described previously. Following are the details of the input-output that cause inefficiency in each of these zakat institutions. The actual value is the input-output value used.

The target is the expected achievement to reach a relative efficiency level. Potential improvement is the percentage of increased efficiency to achieve the expected value or the gap between the expected actual value and target. Potential improvements for achieving the efficiency of zakat institutions in Indonesia are detailed in Table 4.

Table 4. Potential improvement of input-output (Indonesia)

Year		Baznas	BRI	BSMU	D.Duafa	D.Dakwah	R.Zakat	RYA	Mean
2016	Efficiency	0.57	0.73	0.41	0.82	1.00	0.73	0.94	0.74
	ZC	-	-	-	-	-	-	-	-
	ZE	-0.61	-0.03	-	-0.48	-	-	-0.19	-0.33
	ZD	0.75	0.37	1.42	0.22	-	0.37	0.07	0.53
2017	Efficiency	0.71	0.61	1.00	0.68	0.89	0.77	0.74	0.77
	ZC	-	-	-	-	-	-	-	-
	ZE	-0.57	-	-	-0.49	-	-	-0.06	-0.37
	ZD	0.42	0.65	-	0.48	0.12	0.30	0.36	0.39
2018	Efficiency	1.00	1.00	1.00	0.77	0.84	0.74	0.68	0.86
	ZC	-	-	-	-	-	-	-	-
	ZE	-	-	-	-0.58	-0.14	-	-0.03	-0.32
	ZD	-	-	-	0.31	0.19	0.35	0.47	0.33
2019	Efficiency	0.76	0.95	1.00	0.79	0.97	0.83	0.71	0.86
	ZC	-	-	-	-	-	-	-	-
	ZE	-0.48	-0.10	-	-0.37	-0.31	-	-0.14	-0.28
	ZD	0.32	0.06	-	0.27	0.03	0.21	0.42	0.22
2020	Efficiency	0.76	0.85	0.82	0.68	0.70	0.72	0.72	0.75
	ZC	-	-	-	-	-	-	-	-
	ZE	-0.39	-	-	-0.37	-0.28	-0.32	-0.13	-0.30
	ZD	0.33	0.18	0.22	0.47	0.44	0.39	0.39	0.34

Source: DEAP 2.1

The average efficiency of all zakat institutions in Indonesia has increased period 2016 to 2019, namely 74%, 77%, 86%, and 86%. However, it experienced a decrease in 2020 of 75%. Technical efficiency is measured from technical and operational relationships in the process of converting input into output. This means that to increase efficiency it is sufficient to control and manage resources to the maximum. The inefficiency of the intermediation approach occurs in the input variable, namely zakat fund expenses, and the output variable, namely zakat distribution.

Inefficiency in the use of input zakat fund expenses by zakat institutions is shown from the total zakat fund expenses which is greater than the target.

This indicates that its role as an input is not optimal to produce output. The management of this zakat fund can be allocated to the development of a system that can make it easier for people to pay zakat. So 'that it can increase the number of zakat receipts and the impact on the greater output of zakat distribution given. The greatest inefficiency occurs in the output of zakat distribution which has not reached the target. Inefficiency can be increased by optimizing the distribution of infaq and zakat funds to people who are entitled to receive them. Effective human resource management can influence improving the administration of zakat in distributing zakat funds [49].

Table 5. Potential improvement of input-output (Malaysia)

Year		Kedah	P Pinang	Terengganu	Melaka	Sabah	Selangor	Pahang	Mean
2016	Score	0.85	0.74	0.92	0.73	0.73	0.98	0.80	0.82
	ZC	-	-	-	-	-	-	-	-
	ZE	-0.14	-0.18	-0.03	-0.37	-0.07	-	-0.13	-0.15
	ZD	0.18	0.35	0.09	0.38	0.37	0.02	0.25	0.23
2017	Score	0.82	0.80	1.00	0.62	0.62	0.75	0.81	0.77
	ZC	-0.06	-	-	-	-	-	-	-0.06
	ZE	-	-0.08	-	-0.29	-	0	-0.10	-0.12
	ZD	0.22	0.25	-	0.61	0.62	0.34	0.23	0.38
2018	Score	0.74	0.62	0.91	0.68	0.69	1.00	0.74	0.77
	ZC	-	-	-	-	-	-	-	-
	ZE	-0.28	-	-	-0.38	-	-	-0.13	-0.26
	ZD	0.35	0.60	0.10	0.48	0.46	-	0.36	0.39
2019	Score	0.76	0.67	0.87	0.66	0.64	1.00	0.66	0.75
	ZC	-	-	-0.04	-	-	-	-	-0.04
	ZE	-0.13	-0.02	-	-0.30	-	-	-	-0.15
	ZD	0.32	0.50	0.15	0.51	0.57	-	0.51	0.43
2020	Score	0.75	0.69	0.73	0.52	0.69	0.99	0.72	0.72
	ZC	-0.04	-	-0.02	-	-	-0.06	-	-0.04
	ZE	-	-0.13	-	-0.31	-	-0.06	-0.04	-0.13
	ZD	0.34	0.45	0.37	0.94	0.57	0.01	0.40	0.44

Source: DEAP 2.1

Table 4 shows the potential improvements to achieve the efficiency of zakat institutions in Malaysia. The average efficiency of all zakat institutions in Malaysia has decreased from 2016 to 2020, namely by 82%, 77%, 77%, 75%, and 72%. The greatest inefficiency is caused by the output variable of zakat distribution which has not reached the target or is less than optimal in the distribution of zakat. The average potential improvement of the output variable increases every year, meaning that zakat institutions are less effective in distributing zakat funds to people in need. The ineffective management of human resources is one of the causes of inefficiency in the variable input zakat fund expenses. Training for amil can increase their knowledge and skills in managing zakat funds fairly and effectively [44]. The last inefficiency of the output variable zakat collection is still not optimal for distribution, because it is still below the target of achieving 100 percent efficiency. Inefficiency also occurs in the input of zakat collection that exceeds the efficient target. However, the inefficiency in the collection of zakat is not significant and occurs only in a few years.

Table 6. Independent samples test

		Sig. (2-tailed)
Zakat Institution Efficiency	Equal variances assumed	0.378
	Equal variances not assumed	0.378

Source: SPSS

The findings from the independent samples test of difference are shown in Table 5. Sig. (2-tailed) > 0.05, then it was found that there was no significant difference between the efficiency of zakat institutions in Indonesia and Malaysia. These findings support the result [40]. Indonesia and Malaysia have become a reference for other countries in managing zakat [41]. The inefficiencies of these two countries are dominated by the output variable of zakat distribution or zakat distribution. In terms of zakat distribution, the two countries have implemented social programs aimed at helping zakat recipients, such as educational, health, and social assistance programs. However, there is still a lack of accurate data on zakat recipients and supervision of the use of zakat funds.

4.2. Stability of Zakat Institutions in Indonesia and Malaysia

After conducting efficiency testing with DEA, window analysis is conducted to determine the efficiency stability of each zakat institution. The determination of adequate window length is adopted from [45]. Thus, the window analysis in this study is divided into 3 windows, where the length of each window is 3 years.

Table 7 shows the summary of window analysis test results in Indonesia which provides 4 analysis indicators, namely Long Distance per Year (LDY), Long Distance per Window (LDW), Long Distance per All Period (LDP), and standard deviation (SD). The main indicator used to see the stability of efficiency is Long Distance Per Year (LDY). The smaller the LDY value, the better the efficiency stability of the zakat institution.

Table 7. DEA Window Analysis of Indonesian Zakat Institution

Zakat Institution	Window	Efficiency Score					Summary Measures				
		2016	2017	2018	2019	2020	Mean/Window	The Mean	SD	LDW	LDP
Baznas	W1	0.57	0.71	1.00			0.76				
	W2		0.71	1.00	0.76		0.82	0.82	0.06	0.43	0.43
	W3			1.00	0.81	0.84	0.88				
	LDY	x	0.00	0.00	0.06	x			0.06		
BRI	W1	0.73	0.61	1.00			0.78				
	W2		0.61	1.00	0.95		0.85	0.86	0.08	0.40	0.40
	W3			1.00	0.96	0.86	0.94				
	LDY	x	0.00	0.00	0.01	x			0.01		
BSMU	W1	0.41	1.00	1.00			0.80				
	W2		1.00	1.00	1.00		1.00	0.92	0.10	0.59	0.59
	W3			1.00	1.00	0.84	0.95				
	LDY	x	0.00	0.00	0.00	x			0.00		
D. Duafa	W1	0.82	0.68	0.77			0.75				
	W2		0.68	0.77	0.79		0.74	0.76	0.03	0.12	0.18
	W3			0.80	0.85	0.73	0.79				
	LDY	x	0.00	0.03	0.07	x			0.07		
D. Dakwah	W1	1.00	0.89	0.84			0.91				
	W2		1.00	0.90	1.00		0.97	0.93	0.03	0.29	0.29
	W3			1.00	1.00	0.71	0.90				
	LDY	x	0.11	0.16	0.00	x			0.16		
R Zakat	W1	0.73	0.77	0.75			0.75				
	W2		0.77	0.74	0.83		0.78	0.78	0.04	0.11	0.16
	W3			0.80	0.89	0.78	0.82				
	LDY	x	0.00	0.06	0.06	x			0.06		
RYA	W1	0.94	0.74	0.68			0.78				
	W2		0.74	0.68	0.71		0.71	0.74	0.04	0.26	0.26
	W3			0.68	0.73	0.76	0.72				
	LDY	x	0.00	0.00	0.03	x			0.03		

The most stable zakat institution in Indonesia is BSMU with the lowest Long Distance Per Year (LDY) score of 0 and a high average efficiency score of 92%. However, it has a high LDW and LDP score of 0.59. This shows a significant change in efficiency in 2016-2017, from an efficiency score of 0.41 to a perfect efficiency of 1. Meanwhile, the Da'wah Council is the least stable zakat institution with high

efficiency, as it has the highest LDY score of 0.16, and the highest average efficiency of 93%.

The efficiency trend of zakat institution in Indonesia has increased from each window period 1 to 3. However, Rumah Yatim Ar Rohman zakat institution has decreased efficiency from each window period.

Table 8. DEA Window Analysis of Malaysia Zakat Institution

Zakat Institution	Window	Efficiency Score					Summary Measures				
		2016	2017	2018	2019	2020	Mean/Window	The Mean	SD	LDW	LDP
Kedah	W1	0.85	0.82	0.74			0.80				
	W2		0.82	0.74	0.76		0.77	0.80	0.02	0.11	0.11
	W3			0.81	0.82	0.80	0.81				
	LDY	x	0.00	0.07	0.06	x			0.06		
P Pinang	W1	0.74	0.80	0.62			0.72				
	W2		0.80	0.62	0.67		0.70	0.72	0.02	0.18	0.18
	W3			0.71	0.76	0.78	0.75				
	LDY	x	0.00	0.08	0.09	x			0.09		
Terengganu	W1	0.92	1.00	0.91			0.94				
	W2		1.00	0.91	0.87		0.93	0.93	0.01	0.21	0.21
	W3			1.00	0.95	0.79	0.92				
	LDY	x	0.00	0.09	0.08	x			0.09		
Melaka	W1	0.73	0.62	0.68			0.68				
	W2		0.62	0.68	0.66		0.65	0.67	0.01	0.16	0.16
	W3			0.73	0.73	0.57	0.68				
	LDY	x	0.00	0.05	0.06	x			0.06		
Sabah	W1	0.73	0.62	0.69			0.68				
	W2		0.62	0.69	0.64		0.65	0.69	0.04	0.11	0.14
	W3			0.74	0.69	0.76	0.73				
	LDY	x	0.00	0.05	0.05	x			0.05		
Selangor	W1	0.98	0.75	1.00			0.91				
	W2		0.75	1.00	1.00		0.92	0.94	0.05	0.25	0.25
	W3			1.00	1.00	0.99	1.00				
	LDY	x	0.00	0.00	0.00	x			0.00		
Pahang	W1	0.80	0.81	0.74			0.78				
	W2		0.81	0.74	0.66		0.74	0.77	0.03	0.15	0.16
	W3			0.84	0.73	0.82	0.79				
	LDY	x	0.00	0.10	0.07	x			0.10		

The summary of window analysis of Malaysia zakat institution can be seen in Table 8. Selangor is the most stable zakat institution and has the highest efficiency score. Selangor has LDY score of 0 and average efficiency of 94%. The zakat institution also experienced the most significant change in efficiency with LDW and LDP scores of 0.25. Meanwhile, Pahang has the least stability in Malaysia during the observation period with LDY score of 0.1.

The efficiency of zakat institution in Malaysia has decreased from window period 1 to 2. However, the trend increased in period 3. However, Selangor experienced an increase in efficiency from period 1 to 3.

To further evaluate the performance of zakat institutions in Indonesia and Malaysia, we classify them based on their efficiency and stability into four quadrants. Quadrant I consists of zakat institutions with high efficiency score and high stability which are the top performers. Quadrant II consists of zakat institutions with high efficiency but low stability. Meanwhile, zakat institutions with low efficiency but high stability are in quadrant III. Finally, quadrant IV consists of zakat institutions with low efficiency score and less stable. The efficiency score is obtained from the average efficiency of the window analysis result, and the stability is based on the LDY score. Figure 2. shows the details of the quadrant categories.

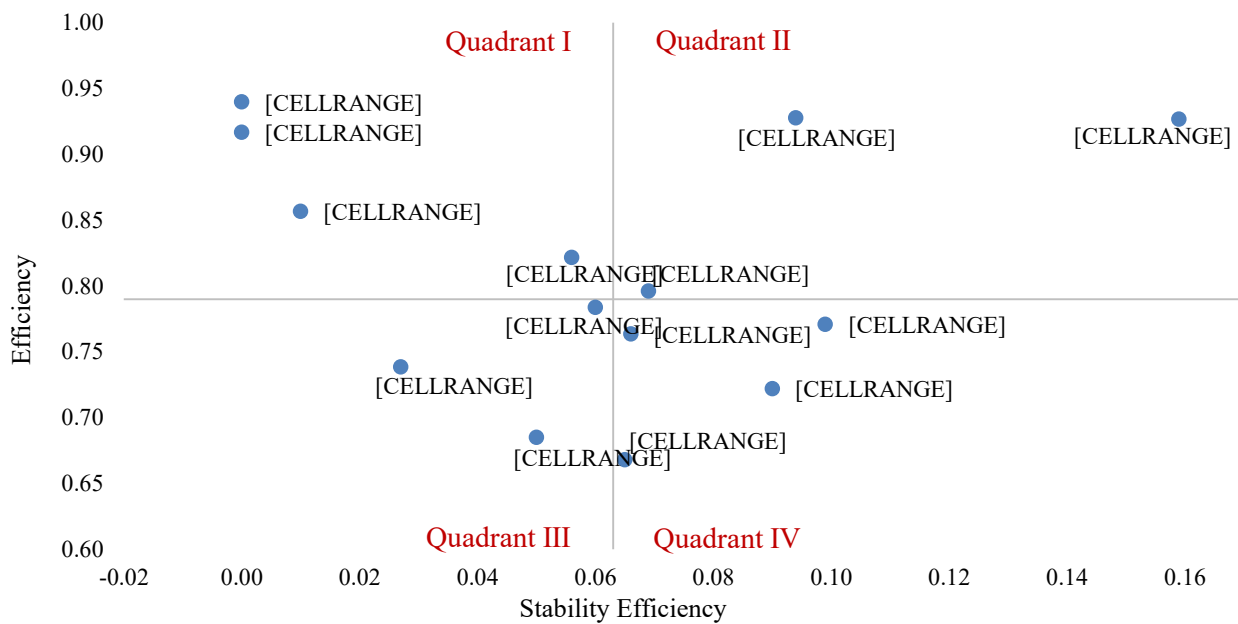


Figure 2. Efficiency-Stability Efficiency Quadrant of Zakat Institutions

There is 1 zakat institution in Malaysia, and 3 zakat institutions in Indonesia that are in quadrant I. Selangor, BSMU, BRI Foundation, and Baznas are top performing zakat institutions that have high efficiency and high stability. The efficiency of the 4 zakat institutions has increased during the period 2016 - 2019. However, it experienced a slight decrease in 2020 due to less than optimal in distributing zakat.

Quadrant II consists of 1 zakat institution in Indonesia, namely Dewan Dakwah, and 2 zakat institutions in Malaysia, namely Terengganu, and Kedah. These three zakat institutions have high efficiency but tend to be less stable. Da'wah Council is the zakat institution that is least able to maintain the stability of its efficiency level.

Rumah Zakat, Rumah Yatim Ar Rohman, and Sabah are zakat institutions that have low efficiency but able to maintain its stability during the observation period. In Quadrant III, the zakat institution with the lowest efficiency level is Sabah. The inefficiency is caused by the unachieved target of zakat distribution.

Dompot Duafa, Pahang, Pulau Pinang, and Melaka are the zakat institutions with the worst efficiency and stability during the observation period. These zakat institutions have not been able to achieve efficiency and maintain stability. The zakat institution in this quadrant makes negligible progress. This is because zakat institutions are less effective in managing resources and distributing zakat funds.

5. Conclusion

The findings of this study contribute to an improved understanding of the operational performance of zakat funds in Malaysia and Indonesia. Overall, the technical efficiency of zakat institutions in Indonesia and Malaysia fluctuated during the period 2016-2020. The inefficiency of both countries is mainly influenced by the output variable of zakat distribution. So it is very important to improve the management of the distribution of zakat funds.

There is no significant difference in the efficiency level of zakat institutions in Indonesia and Malaysia. Both countries have great potential to improve the management capabilities of zakat institutions and utilize technology in managing zakat funds to increase transparency and accountability in zakat management.

Based on window analysis, the one with the highest average efficiency score during the 2016-2020 period is Selangor zakat institution with a score of 94%. The top performing zakat institutions are Selangor, BSMU, BRI Foundation, and Baznas because they have the highest efficiency and stability.

By using the DEA window analysis research method in calculating the efficiency level of zakat institutions in Indonesia and Malaysia, this research has filled the gap of previous studies which mostly use the standard DEA approach. The result of this research can help zakat institution in evaluating the efficiency score. By referring to the input and output variables, the manager of zakat institution can identify the variables that need to be improved in order to obtain the maximum level of efficiency.

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