MEASURING THE EFFICIENCY OF WAQF FUND IN INDONESIA

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ABSTRACT

This research measures the efficiency of waqf funds managed by philanthropic institutions in Indonesia using the Data Envelopment Analysis (DEA) approach over the 2013-2021 period. The unit of analysis consists of nine philanthropic waqf institutions. In the measurement of efficiency using production approach, the study takes human resource expenses, operational costs and fixed assets as inputs and collection and distribution of waqf funds as outputs. The findings indicate that the efficiency of philanthropic organizations in handling waqf funds varies from year to year between 2013 and 2021. The study also notes that the Covid pandemic has no substantial impact on the efficiency of the waqf institutions. Interestingly, regional institution clusters are more efficient than mass organization and national institution clusters.

Keywords: Efficiency, Waqf fund, DEA, Indonesia.
JEL classification: C14; G20; G21.

I. INTRODUCTION

Waqf, which literally means keeping or holding (Chowdhury et al., 2011), refers to an Islamic endowment of assets or property to be held in trust and managed for charitable causes. Traditionally, waqf assets are confined to immovable property such as land and buildings (Khamis & Che Mohd Salleh, 2018). More recently, Islamic scholars have allowed the waqf assets to be movable assets. The Waqf assets, regardless of whether they are immovable or movable, must be managed property so that their benefits to beneficiaries of waqf can be maximized.

Being a philanthropic institution, a waqf institution plays an essential role in economic system, especially in supporting the basic needs and providing infrastructure to society (Sadeq, 2002; Islahi, 2003). The waqf institution has been widely accepted as one of the foundations for building a society and promoting its welfare. It has a vital role in achieving equity, in reducing poverty and in being a development catalyst for a country. This further emphasizes that the waqf assets must be appropriately managed to generate returns for the benefit of designated beneficiaries (Saad & Anuar, 2009; Tohirin & Hudayati, 2011; Saifuddin et al., 2014; Khamis & Che Mohd Salleh, 2018). Indeed, it can be instrumental in supporting the welfare during stress times such as during the Covid-19 pandemic.

In light of this, assessing the efficiency of the waqf institutions is necessary and important as a first step for the improvement of waqf management. Thus, in this paper, we measure the efficiency of philanthropic institutions that manage waqf funds in Indonesia. In the literature, to the best of our knowledge, there are only four studies on waqf efficiency - Herindar & Rusydiana (2021); research by Hasan et al. (2020); Pyeman et al. (2016); and Bakri et al. (2020). These studies employ the Data Envelopment Analysis (DEA) approach to measure waqf efficiency. Along this line of studies, we measure the efficiency of waqf funds in philanthropic institutions in Indonesia during the period 2013-2021 using the Data Envelopment Analysis. However, we differ from them by adding the analysis of super efficiency as a robustness check. We also employ the most recent data and assess whether there are differences in efficiency of various types of the philanthropic institutions: national institutions, regional institutions, and mass organizations. In the analysis, we also identify input or output variables that need to be improved to enhance the performance of waqf funds.

This research is organized into several parts. The second part generally discusses the theoretical basis and reviews some previous studies. The third section explains the methodology. The fourth section presents and discusses the results. The last part of this research is the closing which summarizes the main discussion and provides recommendations.

II. LITERATURE REVIEW

Waqf instrument is expected to play an important role in resolving social and economic issues, especially in time of covid-19 pandemic. For instances, waqf assets can be utilized to assist in the provision of health facilities during the COVID-19 pandemic. In addition, due to empowerment, waqf funds can be channelled to finance disadvantaged communities and those affected by the pandemic or natural disasters. At the same time, during the Covid-19 pandemic, the Islamic

philanthropy sector, particularly the waqf as one of the institutions can equally be adversely affected. Hence, there is a need to to improve its performance efficiency.

Research on the efficiency of Islamic financial institutions (IMFIs) is rather limited (Widiarto & Emrouznejad, 2015). Majority of studies have been on the efficiency of *for-profit* organizations (Widiarto & Emrouznejad, 2015; Al-Awlaqi & Aamer, 2019; Berguiga et al., 2020) and to a lesser extent on zakat institutions (Wahab & Rahman, 2011; Wahab & Rahman, 2012; Wahab & Rahman, 2013; Ahmad & Ma'in, 2014; Djaghballou et al., 2018; Nahar, 2018; Ramadhani & Cahyono, 2018). There has been even fewer studies on institutions engaged in waqf programs.

Pyeman et al. (2016) examine the efficiency of Waqf departments under the State Islamic Religious Council (SIRC) in Malaysia from 2007 to 2012 using the Data envelopment analysis (DEA). They construct five indices of the Waqf management efficiency (WME) and decompose the total factor productivity (TFP) into changes in technical and technical efficiencies. The study's findings reveal that the SIRC Waqf department with the highest efficiency improvement over the sample period is in the state of Penang; therefore, this state is a benchmark for other Malaysian states.

Using DEA, Hasan et al. (2020) examine the efficiency of waqf in three SIRCs of Kelantan, Pahang, and Penang between 2008 and 2010. Again, Penang emerges to have the highest efficiency rating. Meanwhile, both Kelantan Waqf Department and Pahang Waqf Department need to immediately make improvements, inluding expanding staff, branches, and so on. Therefore, the Penang Waqf Department can be a benchmark for the other two states to obtain the best operational practices.

Bakri et al. (2020) propose a conceptual model of the efficiency of waqf institutions. The TE measurement may be a reliable predictor of any SIRC best management approach. The researchers determine an efficiency score ranged from zero, equivalent to zero per cent efficiency, to one, which is equal to a hundred per cent efficiency score, based on DEA ratings. Scores can also be used to establish standards, particularly for the most effective decision-making unit (DMU) (SIRC), to serve as a model for the performance of other DMUs.

Noordin et al. (2017) conducte a comprehensive and critical literature review of the performance measurement literature related to third sector organizations and waqf institutions. The findings show that an efficient performance monitoring system is vital in promoting good governance and ethical management of waqf organizations. They identify four critical performance criteria related explicitly to waqf institutions: (i) efficiency, (ii) social efficiency, (iii) maqasid al-Syariah, and (iv) sustainability and growth. In addition, the recommended framework for evaluating the performance of waqf institutions are (i) the suitability of the goals and activities of the waqf institution with maqashid sharia and the interests of Muslims; and (ii) sustainability and expansion. In conclusion, they propose eight phases to guide waqf institutions as they develop their comprehensive PMS.

According to Khamis and Che Mohd Salleh (2018), the current methods of human resources, documents, and reporting in cash waqf organizations are not in line with the pace of development. Therefore, this study proposes several changes for each factor: (1) Waqf institutions should establish staff training programs, waqf expert management boards, and use key performance indices for human resource development; (2) Waqf institutions must improve their records and develop more

complex waqf programs; and (3) Waqf institutions are required to produce more reliable and transparent reports.

Herindar and Rusydiana (2021) examine the efficiency of waqf management in eight zakat institutions in Indonesia. This study's input variables consist of operational expenses and human resource costs. The amount and allocation of waqf funds constitute the output variable. The research highlights several points. First, the efficiency of zakat agencies in administering waqf funds varies between 2013 and 2020. The major contributor to waqf efficiency is the collection and distribution variable. Finally, three decision-making units (DMU), namely Laziz Dewan Da'wah, Darut Tauhid, and Dompet Dhuafa, serve as examples for other DMUs. They become models for other institutions because of their superior creativity and professionalism.

Ibrahim et al. (2021) examine the efficiency of 13 waqf entities in Malaysia from 2007 to 2013. Two fundamental Data Envelopment Analysis (DEA) models are used to measure technical efficiency. Research reveals that only one waqf institution is efficient, while the rest are inefficient. Further examination of the technical efficiency component also shows that the managerial inefficiency and not scale inefficiency that accounts for waqf inefficiency. Due to these findings, they propose a change from manual evaluation to automation using artificial intelligence (AI) to save time and human errors and improve current assessment procedures.

Based on the literature review from several studies above, research on efficiency in philanthropic institutions is limited and mostly confined to the case of Malaysia. Very few studies have been done on Indonesia. More importantly, there has been no research that has measured the efficiency of philanthropic institutions managing waqf in Indonesia using a complete DEA approach, the gap that this study seeks to fill.

III. METHODOLOGY
3.1. Data
The decision-making efficiency (DMU) in this study are philanthropic institutions that manage waqf funds in Indonesia. Based on data available, we have a total of nine philanthropic institutions – 4 national institutions, 3 regional institutions and 2 mass organizations. The data are annually from 2013 to 2021. Table 1 below provides the data availability by DMU and by year according to the three types of philanthropic institutions.

Table 1.
DMUs Data

No	Type of Institution	Annual Report								
		2013	2014	2015	2016	2017	2018	2019	2020	2021
National Institution										
1	DMU 1	NA	√	√	√	√	√	√	√	√
2	DMU 2	NA	NA	NA	√	√	√	√	√	√
3	DMU 3	NA	NA	NA	√	√	√	√	√	NA
4	DMU 4	√	√	√	NA	NA	NA	NA	NA	NA
Regional Institution										
1	DMU 1	√	√	√	√	√	√	NA	NA	NA
2	DMU 2	NA	√	√	√	√	√	√	√	√
3	DMU 3	NA	NA	NA	NA	√	√	√	√	NA
Mass Organisation Inst.										
1	DMU 1	NA	NA	NA	NA	√	√	√	√	NA
2	DMU 2	NA	√	√	√	NA	NA	NA	NA	NA

3.2. Model Development
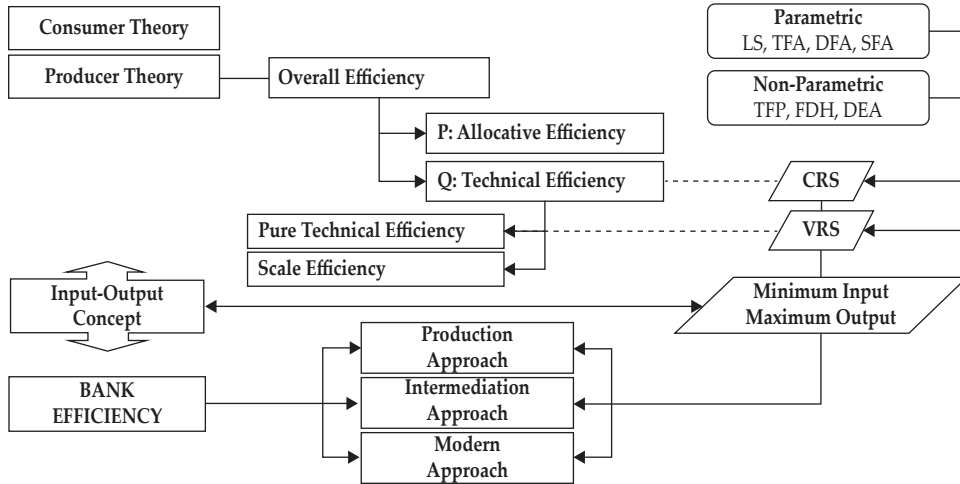
Source: Ascarya et al. (2008)

Figure 1.
DEA Model

The Charnes, Cooper and Rhodes (CCR) DEA model and the Banker, Charnes and Cooper (BCC) model have been widely adopted to measure efficiency since their introduction in 1984 (Coelli et al., 2005). The treatment of returns to scale is the main difference between the CCR and BCC models. The CCR model assumes a constant return to ccale (CRS), while the BCC model assumes that each DMU operates with a variable return to scale (VRS) (Ascarya & Yumanita, 2006). CRS posits that an increase in input will be followed by a proportionate increase by the same percentage in output. On this basis, the CRS is more applicable when the DMU operates at an optimal scale. However, the inefficiency that occurs in an institution is based on competition and financial constraints. To anticipate this, Banker, Charnes and Cooper (1984) propose a DEA model with a VRS approach. The VRS approach is capable of measuring Technical Efficiency (TE) or also known as Pure Technical Efficiency (PTE). VRS states that an additional input by a certain percentage (say X%) may result in the change in output by more or less than X%. (Ascarya & Yumanita, 2006). Using frontier estimation based on CRS and VRS, it is possible to divide the overall technical efficiency into pure technical efficiency and scale efficiency (Coelli et al., 2005).

Using the data, the DEA identifies the reference points and defines the efficient frontier as the best practice production technology and finally evaluates the inefficiencies as deviation from the frontier. All the inefficient DMUs will lie below the efficient frontier. Besides producing efficiency value for each DMU, the DEA also determines the DMUs that are used as benchmark for other inefficient DMU.

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

DMU = decision making unit   n = number of DMU evaluated
m = different inputs   xij = number of input i consumed by DMUj
p = different outputs   ykj = number of output k produced by DMUj

The Data Envelopment Analysis is the most popular non-parametric method for measuring efficiency. In addition, the DEA method is appropriate for measuring efficiency with insufficient data. Similar to this study, there are a number of philanthropic organizations for which input and output variable data are not available for a given year. The disadvantage of the DEA model is difficult to determine the optimal ranking of DMUs when multiple DMU units are equal to 1. Then, Anderson and Petersen (1993) present the notion of super efficiency. The fundamental concept of super-efficiency is permitting the observed DMU efficiency to exceed 1 or 100 percent. Accordingly, for robustness, we also employ the super-efficiency DEA method developed by Andersen and Petersen (1993):

$$max_{\varphi_k} - \varepsilon\left[\ \sum_{i=1}^{m} S_i^{-} +\ \sum_{r=1}^{s} S_r^{+}\ \right] \tag{1}$$

Subject to:

$$x_{ik} \; \textstyle\sum_{j=1}^{n} \lambda_j x_{ij} - S_i^- = 0$$

$$\sum_{\substack{j=1 \\ j\,k}}^{n} \lambda_j x_{ij} \; - \; S_r^+ \; = \; \varphi_k y_{rk}$$

$$\sum_{\substack{j=1 \\ j\neq k}}^{n} \lambda_j \; = \; 1$$

$$\lambda_j, S_i^- S_r^+ \; \geq \; 0, \; j \neq k$$

i = 1, 2..., m, j = 1, 2..., n, r = 1,2,...,s
k = DMU under study

3.3. Method
Data Envelopment Analysis
The Data Envelopment Analysis (DEA) used in this study is based on the output oriented and production approach, where the output is maximized given the input level. The currently collected and distributed waqf funds are still far from their potential, so output-oriented measurements are more appropriate to measure waqf funds' efficiency.

Operational and HR costs are the input factors while the waqf funds received and the waqf funds distributed are the output variables, which are in line with Wahab & Rahman (2013), Djaghballou et al. (2018), Yunani et al. (2020). In other words, philanthropic institutions are seen as producers in this study and aim to maximize output. The selection of input and output variables used in this study refers to several relevant studies as presented in Table 2.

Table 2.
Input and Output Variable Reference

Variable	Reference
Input	
Operational Cost	Yunani et al. (2020)
SDM Cost	Wahab & Rahman (2012)
Fixed Assets	
Output	
Collection	Ahmad & Ma'in (2014)
Distribution	Ahmad & Ma'in (2014)

DEA is a technique to evaluate the relative efficiency of production units and managerial performance of decision making units (DMU), using various selected inputs and outputs, where the correlation function from input to output is unknown (Blose et al., 2005). Efficiency scores from DEA range between 0 and 1 or 100%. DMU with a score of 100% indicates the DMU is efficient. The lower the DMU score, the more inefficient the institution is.

IV. RESULTS AND ANALYSIS
4.1. Results
Input and Output Variables
Table 3 provides an overview of the input and output variables and descriptive statistics used in this study from waqf funds managed by philanthropic institutions during 2013-2021.

Table 3.
Input and Output Variables

Variable	Mean	Min	Max	St.Dev
Input				
Operational Cost	IDR 6.147.307.502,74	IDR 83.095.929,00	IDR 39.010.725.441,00	IDR 8.969.406.341,75
SDM Cost	IDR 9.594.037.575,91	IDR 387.651.000,00	IDR 29.261.679.034,00	IDR 9.501.017.463,22
Fixed Asset	IDR 25.577.107.301,13	IDR 94.848.133,00	IDR 185.472.475.432,00	IDR 50.054.853.779,43
Output				
Collection	IDR 4.479.932.459,26	IDR 800.000,00	IDR 34.449.727.582,00	IDR 8.448.299.759,46
Distribution	IDR 2.255.376.809,35	IDR 800.000,00	IDR 13.506.036.966,00	IDR 3.505.374.651,42

Efficiency Level
The efficiency scores of waqf funds are provided annually using a common frontier based on the DEA method. The table below (Table 4) shows the average Technical Efficiency (TE), Pure Technical Efficiency (PTE), and Scale Efficiency (SE) of waqf funds managed by zakat institutions from 2013 (Panel A), 2014 (Panel B), 2015 (Panel C), 2016 (Panel D), 2017 (Panel E), 2018 (Panel F), 2019 (Panel G), 2020 (Panel H), 2021 (Panel I) and the whole sample period (Panel J). We also provide the scores by DMU in Table 5.

Table 4.
Summary of Statistics on Efficiency Score (TE, PTE dan SE) per Year

Years/Type of Efficiency	Mean	Min	Max	St.Dev
Panel A (2013)				
TE	0,155	0,055	0,309	0,154
PTE	0,5	0,065	1	0,5
SE	0,621	0,309	0,934	0,312
Panel B (2014)				
TE	0,343	0,055	1	0,388
PTE	0,373	0,065	1	0,377
SE	0,789	0,641	1	0,131
Panel C (2015)				
TE	0,452	0,055	0,913	0,293
PTE	0,521	0,075	1	0,332
SE	0,795	0,59	0,977	0,148
Panel D (2016)				
TE	0,485	0,156	1	0,348
PTE	0,722	0,236	1	0,31
SE	0,667	0,193	1	0,274
Panel F (2017)				
TE	0,359	0,069	1	0,409
PTE	0,532	0,077	1	0,413
SE	0,72	0,015	1	0,329
Panel G (2018)				
TE	0,35	0,052	1	0,377
PTE	0,368	0,062	1	0,397
SE	0,962	0,894	1	0,033
Panel H (2019)				
TE	0,402	0,051	1	0,392
PTE	0,424	0,063	1	0,41
SE	0,951	0,879	1	0,044
Panel I (2020)				
TE	0,393	0,054	1	0,434
PTE	0,396	0,074	1	0,431
SE	0,939	0,862	1	0,053

Table 4.
Summary of Statistics on Efficiency Score (TE, PTE dan SE) per Year (Continued)

Years/Type of Efficiency	Mean	Min	Max	St.Dev
Panel J (2021)				
TE	0,415	0,09	1	0,414
PTE	0,418	0,092	1	0,413
SE	0,979	0,956	1	0,018
Panel K (All Years)				
TE	0,387	0,051	1	0,385
PTE	0,476	0,062	1	0,41
SE	0,835	0,263	1	0,224

Based on the table 4, it can be seen that the highest average Technical Efficiency (TE) and Pure Technical Efficiency (PTE) scores for waqf funds managed by zakat institutions in Indonesia are in 2016, namely TE (0.485) and PTE (0.722). Meanwhile, the lowest TE average score is in 2013 (0.115), and the lowest PTE is in 2018 (0.368). Together with Table 5, the efficiency level of waqf funds managed by zakat institutions fluctuates yearly.

Table 5.
Waqf Funds Efficiency Score

No	Name of Zakat Institution	CRS								
		2013	2014	2015	2016	2017	2018	2019	2020	2021
National Institute										
1	DMU 1	-	-	0,509	0,940	1,000	1,000	0,764	1,000	1,000
2	DMU 2	-	-	-	0,193	0,090	0,065	0,070	0,079	0,0900
3	DMU 3	-	-	-	1,000	0,130	0,139	0,088	0,098	-
4	DMU 4	0,055	0,055	0,055	-	-	-	-	-	-
Regional Institute										
1	DMU 1	0,309	0,143	0,913	0,335	1,000	0,866	-	-	-
2	DMU 2	-	0,228	0,248	0,156	0,075	0,132	0,551	0,209	0,1550
3	DMU 3	-	-	-	-	0,200	0,241	1,000	1,000	-
Ormas										
1	DMU 1	-	-	-	-	0,069	0,052	0,051	0,054	-
2	DMU 2	-	1,000	0,590	0,287	-	-	-	-	-

Table 5.
Waqf Funds Efficiency Score (Continued)

No	Name of Zakat Institution	CRS								
		2013	2014	2015	2016	2017	2018	2019	2020	2021
National Institute										
1	DMU 1	-	-	0,521	1,000	1,000	1,000	0,869	1,000	1,000
2	DMU 2	-	-	-	1,000	0,137	0,067	0,080	0,089	0,092
3	DMU 3	-	-	-	1,000	0,158	0,143	0,094	0,109	-
4	DMU 4	0,065	0,065	0,075	-	-	-	-	-	-
Regional Institute										
1	DMU 1	1,000	0,190	1,000	0,705	1,000	0,969	-	-	-
2	DMU 2	-	0,299	0,376	0,236	0,077	0,133	0,569	0,216	0,1621
3	DMU 3	-	-	-	-	0,352	0,256	1,000	1,000	-
Ormas										
1	DMU 1	-	-	-	-	1,000	0,062	0,063	0,074	-
2	DMU 2	-	1,000	0,704	0,393	-	-	-	-	-

Table 6.
Average of the Efficiency Score

No	Name of Zakat Institution	Technical Efficiency	Pure Technical Efficiency	Scale Efficiency
National Institute				
1	DMU 1	0,887	0,913	0,971
2	DMU 2	0,098	0,244	0,773
3	DMU 3	0,291	0,301	0,921
4	DMU 4	0,055	0,069	0,722
	Mean	**0,333**	**0,382**	**0,847**
Regional Institute				
1	DMU 1	0,594	0,811	0,724
2	DMU 2	0,219	0,259	0,868
3	DMU 3	0,610	0,652	0,877
	Mean	**0,475**	**0,574**	**0,823**
	Ormas			
1	DMU 1	0,056	0,300	0,715
2	DMU 2	0,626	0,699	0,857
	Mean	**0,341**	**0,499**	**0,786**

Table 6 shows the average results of Technical Efficiency and Pure Technical Efficiency by cluster. Based on TE and PTE, the Regional cluster of zakat institutions is the most efficient in managing waqf funds. Meanwhile, the cluster of zakat institutions with the lowest efficiency is the National cluster. Furthermore, an in-depth PTE analysis needs to be conducted to determine the extent to which zakat institutions managing waqf funds can operate optimally. Based on the overall Pure Technical Efficiency analysis, it is known that DMU 1 in the national cluster, DMU 1 and 3 in the regional cluster and DMU 2 in the mass organization cluster are the four institutions with the highest scores. This shows that these four institutions have better management than other institutions.
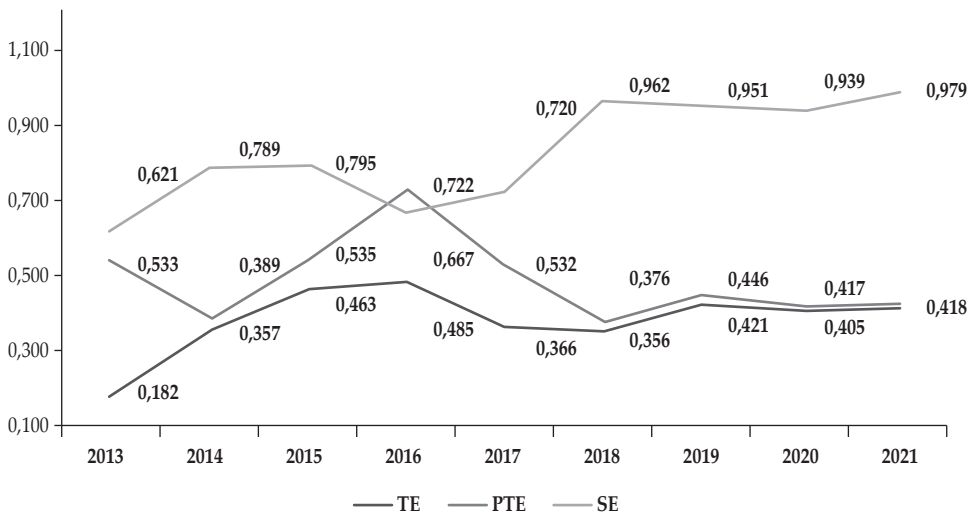
Figure 2.
Trends in Efficiency of Waqf Funds

Figure 2 describes the efficiency trend of zakat institutions that manage waqf funds from 2013 to 2021. From the efficiency graph, we may observe that the Technical Efficiency (TE), Pure Technical Efficiency (PTE) and Scale Efficiency (SE) fluctuate from year to year. The TE increased in 2014, then decreased in 2017 and rose again from 2018 to 2021. Then, for the PTE, the efficiency value declined in 2014 and showed a significant increase in 2016 and moved down in the following years until 2018. In 2019 the PTE increased but then up steadily until 2021. As for the SE, the efficiency level in 2014 continued to move up steadily until 2015, then declined in 2016. And then, the efficiency level moved up periodically until 2021. Based on the efficiency trend, it can be concluded that during the nine-year research period, the efficiency level fluctuates.

Institution	Technical Efficiency	Pure Technical Efficiency	Scale Efficiency
National Institution			
DMU 1			
DMU 2			
DMU 3			
DMU 4			
Regional Institution			
DMU 1			
DMU 2			
DMU 3			
Mass Organization			
DMU 1			
DMU 2			

Figure 3.
Trends in Efficiency of Waqf Funds

Figure 3 shows the efficiency trend of waqf funds managed by zakat institutions in Indonesia. The vertical axis (Y) is the DMU efficiency score and the horizontal axis (X) is year. Looking at the TE, the efficiency of waqf funds in almost every zakat institution fluctuates. Primarily, the efficiency level decreases in the last year of observation, 2021. And zakat institutions that show an increase in the efficiency of waqf funds in the previous year are DMU 1 in the national institutional cluster and DMU 1 and DMU 3 in the regional cluster. For other institutions that continue to experience significant declines, it is necessary to make consistent improvements and pay attention to their performance. Then, similar to the TE analysis, DMU 1 and DMU 4 in the cluster of national institutions consistently improve their PTE. Likewise, with the SE, DMU 1 cluster of national institutions again shows its consistency in making improvements. Meanwhile, in other institutions, efficiency fluctuates and experiences a significant decline in DMU 2 of mass organizations and DMU of 2 regional institutions. Therefore, the consistency of institutions that manage waqf funds is still a severe problem in terms of waqf fund management, affecting the efficiency level.

Potential Improvement
The following analysis is related to potential improvements related to what must be improved to achieve an optimal level of efficiency. Through this potential improvement analysis, variables that need to be enhanced are obtained to reach the optimal level. Furthermore, the study uses the last observation period carried out separately from other periods to get an idea of the value that must be achieved. In other words, the source of inefficiency can be identified from this potential improvement analysis. This is presented in Figure 4 and Figure 5 below.
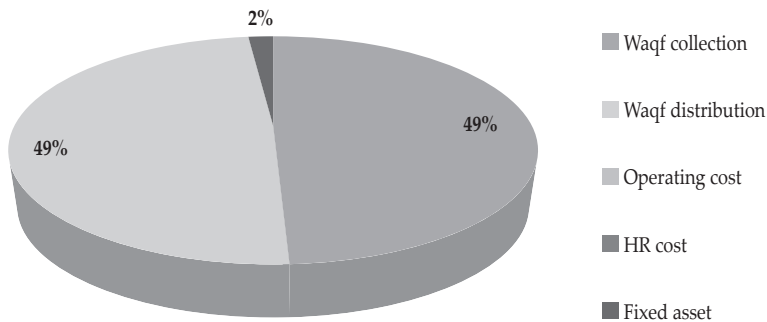
Figure 4.
Potential Improvement Output Oriented
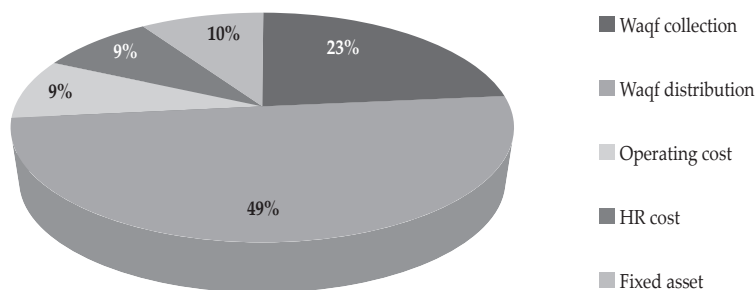
Figure 5.
Potential Improvement Input Oriented

It is known that the variables that cause inefficiency in the management of waqf funds are from the output variables, namely the collection and distribution of waqf funds. Furthermore, the graph explains that to achieve optimal efficiency in the management of waqf funds in zakat institutions, the collection and distribution of waqf funds need to be increased by 49%, respectively, and fixed assets are decreased by 2%.

Table 7.
Potential Improvement Output Oriented per DMU

DMU	Waqf Receipts	Waqf Distribution	Operational Costs	HR Expenses	Fixed Assets
Dompet Dhuafa	0	0	0	0	0
Griya Yatim dan Dhuafa	51%	4%	0	0	45%
Inisiatif Zakat Indonesia	50%	50%	0	0	2%
LAZ Muhammadiyah	50%	49%	0	0	1%
Panti Yatim Indonesia Al-Fajr	48%	47%	0	0	5%
Yayasan Lembaga Manajemen Infaq	0	0	0	0	0
Yayasan Yatim Mandiri Surabaya	40%	51%	0	1%	8%

Table 8.
Potential Improvement Input Oriented per DMU

DMU	Waqf Receipts	Waqf Distribution	Operational Costs	HR Expenses	Fixed Assets
Dompet Dhuafa	0%	0%	0%	0%	0%
Griya Yatim dan Dhuafa	59%	0%	7%	10%	24%
Inisiatif Zakat Indonesia	28%	7%	23%	21%	21%
LAZ Muhammadiyah	40%	16%	15%	16%	15%
Panti Yatim Indonesia Al-Fajr	6%	86%	4%	3%	3%
Yayasan Lembaga Manajemen Infaq	0%	0%	0%	0%	0%
Yayasan Yatim Mandiri Surabaya	27%	0%	23%	23%	27%

4.2. Robustness Test

For robustness, we apply the Super-efficiency DEA method developed by Andersen and Petersen (1993). The results indicate that the average SuperDEA value is often greater than the BCC and CCR models' efficiency values. The Regional Institution group has the highest average efficiency score (0.782) compared to the Mass organization group (0.671) and the National Institution group (0.471).

Table 9.
CCR vs BCC vs SuperDEA

No	Type of Institution	CCR Model	BCC Model	SuperDEA
		Technical Efficiency	Pure Tech. Efficiency	SuperEfficiency
National Institution				
1	DMU 1	0,556	0,883	1,025
2	DMU 2	0,077	0,087	0,087
3	DMU 3	0,291	0,301	0,701
4	DMU 4	0,055	0,069	0,069
	Mean	**0,245**	**0,335**	**0,471**
Regional Institution				
1	DMU 1	0,515	0,629	0,679
2	DMU 2	0,219	0,259	0,259
3	DMU 3	0,602	0,652	1,408
	Mean	**0,446**	**0,513**	**0,782**
Mass Org. based				
1	DMU 1	0,056	0,072	0.072
2	DMU 2	0,593	0,603	1,270
	Mean	**0,325**	**0,338**	**0,671**

4.3. Analysis

Academics, practitioners, and regulators can utilize the research findings regarding the efficiency of waqf funds managed by philanthropic institutions in Indonesia during the period of 2013-2021. This study's first finding relates to the evolution of efficiency levels and the average efficiency value of philanthropic organizations that administer waqf funds over the sample period. From the results, no philanthropic institution manages waqf funds with a maximum level of efficiency (1,000). Waqf funds at these philanthropic institutions are still relatively inefficiently managed on average. In accordance with Herindar and Rusydiana's research from 2022, efficiency waqf funds managed by philanthropic institutions in Indonesia fall into the low category. The high expenses (Operational Cost and HR Cost) on the input variable are one of the factors that contributes to the low efficiency of waqf funds. This research focuses on philanthropic institutions that administer not only waqf funds but also zakat, infaq, and alms funds. Thus, their expenses are not

only for waqf but also for other ZISWAF activities. Due to a lack of specificity in the financial statements, it is impossible for researchers in this instance to determine how much expenses are responsible for waqf funds. Because of that, the high expense reduces the efficiency of waqf funds in philanthropic institutions in Indonesia. Another finding from this study is regional cluster philanthropic institutions are the most efficient waqf fund management institutions, according to the CCR and BCC models, when compared to institutions from the national cluster or mass organizations. Then, based on the study of the BCC model, the four institutions with the highest score for Pure Technical Efficiency are DMU 1 in the national cluster, DMU 1 and 3 in the regional cluster, and DMU 2 in the mass organization cluster.

The results of this study contradict the theory which suggests that a larger company has more convenience to acquire sources of capital that may be used to improve a company's worth. Based on the findings of this study, it is possible that waqf fund administration institutions employ internal funds (Indriyani, 2017). Therefore, philanthropic institutions require a strategy to sustain their level of efficiency. Waqf management institutions may utilize digitalization as one of their options. With the digitization of waqf, management expenses can be decreased, resulting in significant advantages for waqf fund management institutions (Mohamed Yusof et al., 2014). Mohamed Yusof et al. (2014) reiterate that growth of internet banking facilities and digital literacy of younger generations or other online media access could be used to promote online waqf, along with the support of waqf fund institutions for the implementation of online waqf to ensure the successful implementation of the waqf system.

Figures 2 and 3 illustrate the efficiency trend of institutions managing waqf funds during the 2013-2021 research period. During the nine-year study period, analyses of Technical Efficiency (TE), Pure Technical Efficiency (PTE), and Scale Efficiency (SE) reveal variable trends. In order to achieve a level of efficiency in the management of waqf funds, various devices and innovations are essential. Abas and Raji (2018) argue that good management of waqf assets is the most important factor that must be implemented appropriately and sustainably in order to increase value. In addition, good and efficient waqf management can provide more rewards and the opportunity to maximize social or religious benefits (Karim, 2007).

Moreover, we may also note that Covid-19 seems to have no effect on the efficiency of institutions managing waqf funds. This is demonstrated by the constantly rising graph of efficiency beginning in 2019 and continuing until 2021. The results of this study contradict those of Herindar and Rusydiana (2021) claiming that the Covid epidemic reduces the efficiency of waqf funds due to a decrease in the amount of waqf funds collected and dispersed.

Despite the fact that the Covid-19 pandemic has no impact on the efficiency of waqf fund management institutions, the increase in efficiency from 2019 to 2020 to 2021 is still modest. This indicates that the collection of social funds or waqf does not decrease throughout the pandemic. However, Fanani et al. (2021) explain that digital waqf would be more effective in waqf collection and donation because the marketing would be more inclusive of the entire Muslim community. In addition, the management of waqf fund must be improved in order to raise the degree of efficiency. Mohamed Yusof et al. (2014) indicate that by digitizing

waqf, management expenses might be lowered, resulting in significant efficiency gains for waqf fund management institutions. Moreover, digitalization greatly encourages youth participation in digital waqf transactions (Berakon et al., 2022). Thus, the more the potential for waqf collection through digital enhancements, the greater the institution's efficiency value.

The third conclusion of this study is the Potential Improvement of Waqf Funds Efficiency in Indonesia. The slack variable is used to identify inefficient sources. According to the findings of the analysis, the output variables, meaning the collection and distribution of waqf funds, drive inefficiency. The distribution and reception of waqf funds must be increased by 52 percent and 48 percent, respectively, to attain optimal efficiency. Inefficient institutions necessitate the implementation of suitable innovations, particularly to increase the collection and distribution of waqf funds. In this instance, the waqf administration organization can benefit from digitization. Utilizing digitalization will make the collecting of funds more efficient because it will involve a larger portion of the Muslim community in its promotion (Fanani et al., 2021).

This study's fourth and final discovery relates to benchmarking analysis, which provides DMU efficiency-improving recommendations that other DMUs can utilize as a guide. DMU 2 Ormas, DMU 1 Regional, and DMU 1 National are the three DMUs that are frequently utilized as references by other DMUs, according to the results of the analysis. Moreover, an intriguing conclusion in this instance is that the efficiency level of waqf fund management organizations prior to 2021, especially in 2014 and 2017, is higher than in 2021. Managing their waqf fund in a manner that is more consistent, professional, and accountable is a problem for waqf fund management institutions. Given that waqf is in the public interest, it is vital to publicize how resources are handled to generate more benefits, and accountability is one of the foundations for evaluating, assessing, and reporting the performance of the management institution (Sulaiman & Zakari, 2015). According to Yaacob et al. (2015), annual financial reports are the primary recommendation for expressing accountability to stakeholders. Consequently, thorough laws pertaining to waqf management, accounting, and reporting are required, given that comprehensive regulations have a substantial impact on waqf accountability. In addition, Djunaidi and al Asyhar (2005) assert that effective waqf management necessitates precision and professionalism.

V. CONCLUSION AND RECOMMENDATION
5.1. Conclusion
This study examines the efficiency of waqf funds managed by philanthropic institutions in Indonesia over 2013-2021. Based on the study's results, the efficiency level of each DMU or philanthropic institution varies from year to year. Then, from the average results of CCR and BCC, it is known that regional cluster philanthropic institutions have a superior efficiency level than other clusters. The Covid-19 epidemic has no effect on the efficiency of waqf fund management organizations, as evident from the development of efficiency from 2019 to 2021. However, the gain in efficiency was still rather low.

In the examination of possible improvement, the variable that most contributes to the inefficiency of waqf fund management organizations is the output variable. For this reason, if the waqf fund management institution wants to improve its efficiency, the collection and distribution of waqf fund need to be increased by 48 percent and 52 percent, respectively. Furthermore, the benchmarking study describes DMU 2 Ormas, DMU 1 Regional and DMU 1 National into three DMUs typically utilized as references by other DMUs. And the conditions in 2014 and 2017 become conditions with superior efficiency than in 2021.

5.2. Recommendation

As for the recommendations that the author has compiled, it is suggested that the regulators (Indonesian Waqf Board (BWI) and the Indonesian Ministry of Religion) adopt laws or regulations forcing philanthropic institutions or waqf fund managers to submit financial statements. The regulator needs to make and pay attention to the standardization of data and completeness of data in the financial reports carried out by waqf fund management institutions. BWI and the Ministry of Religion must give encouragement and support for waqf fund management institutions so that these organizations can be more accountable for collecting or distributing waqf funds.

Furthermore, institutions that handle waqf fund are supposed to continue improving efficiency by considering the source of inefficiency, which in this instance is the output variable. Waqf management institutions in Indonesia are supposed to be more transparent and consistent in providing their financial statements to promote public trust and can be a source of study. To attain optimal efficiency, waqf fund management organizations should take advantage of digitalization or other innovations that can draw waqf attention to waqf, for example, in collecting or distributing waqf funds using social media or financial technology (fintech) (fintech). With this digitization, it is believed that the distribution of waqf funds will be more precise and widespread. Institutions that manage waqf funds must increase their professionalism in this area. In addition, accountable and precise computations are necessary for measuring an institution's growth.

Further research may incorporate additional relevant variables, add other institutions that manage waqf funds in the study, and use other methods or approaches. For example, the productivity or profitability of waqf fund management institutions is still relevant to research. Thus, the discussion of related research will be more comprehensive and will be able to provide more concrete recommendations to relevant stakeholders.

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