



## Does Financial Technology or Other Factors Increase the Operational Efficiency of Zakat Management Organizations?

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### Abstract

*The purpose of this research is to analyze the efficiency of Zakat Management Organizations (ZMO) in utilizing financial technology to increase the collection and distribution of zakat. Data was obtained from 4 social finance organizations that use financial technology: National Amil Zakat Agency (BAZNAS) for the Republic of Indonesia, Nahdathul Ulama (NU Care), Dompot Dhuafa, and Rumah Zakat between 2018-2019. The methodology used an efficiency approach with the Data Envelopment Analysis (DEA) Program. The operational variables refer to the total costs of operations and socialization serving as input variables. On the other hand, the entire collection and distribution of zakat represent the output variables. The results are the 4 ZMOs based on financial technologies, such as BAZNAS, NU Care, Dompot Dhuafa, and Rumah Zakat, indicate that NU Care is the most efficient ZMO with a score of 1.00 throughout 2018-2019 because it can decrease input costs and optimize output due to its large mass base and volunteer programs up to the village level. Meanwhile, other ZMOs experience inefficiency with a score below 0.60. This is caused by the use of disproportionate inputs and outputs due to ZMOs having multiple roles and a relatively equal ZMO donor base, which causes competition among ZMOs. Hahslm Analysis proves that optimizing ZMO input and output involves efficiently using resources in a balanced way by minimizing costs and maximizing income. Thus, this is an important factor outside financial technology.*

**Keywords :** Zakat; Efficiency; Financial Technology; Zakat Management Organization

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## INTRODUCTION

Zakat is obligatory for Muslims and one of five crucial pillars along with creed, prayer, fasting during Ramadan, and pilgrimage to Baitullah. Zakat became part of Islam as a form of worship of Allah (Mahda) and, simultaneously, a form of worship of *muamalat* (regulations pertaining to commercial activities) among fellow humans to overcome poverty and income inequality (Bakir, 2021).

Indonesia has the highest number of Muslims all over the world, which therefore results in a significant potential for zakat funding. The Indonesian zakat collection in 2020 has a total potential of IDR327.6 trillion (PUSKAS, 2019). On the other hand, the 2019 realization was IDR10.2 trillion, or just 3.1%. This gap is a problem often faced by private and state zakat institutions under the auspices of the National Amil Zakat Agency (BAZNAS, *Badan Amil Zakat Nasional*).

This amount is collected under the zakat collection administered by the Amil Zakat Institution (LAZ, *Lembaga Amil Zakat*) (Solihin & Latifah, 2021). The LAZ in the national, province, regency, and private-managed Amil Zakat Institutions as well as the ZMO in institutional development are registered with BAZNAS. The following information presents data on the zakat collection in Indonesia.

**Table 1: Total Zakat Collection in Indonesia**

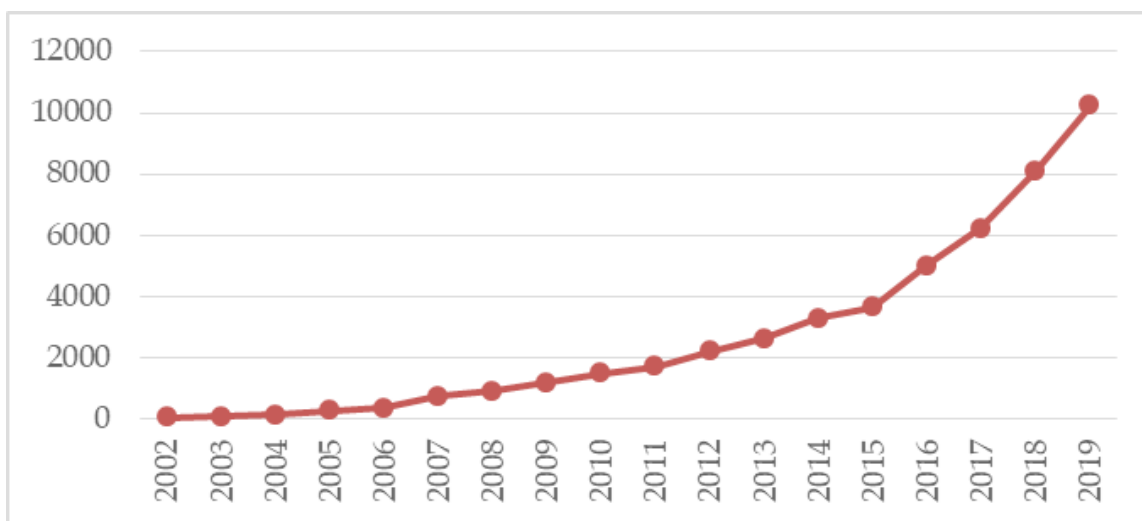
No.	Scale of ZMO	Collection	%
1	BAZNAS	296.234.308.349	2,9
2	BAZNAS Province	583.919.722.674	5,71
3	BAZNAS District	3.539.980.546.674	34,61
4	Amil Zakat Institutions	3.728.943.985.109	36,46
5	ZMO in Monitoring	2.078.865.243.749	20,33
	<b>Total</b>	<b>10.227.943.806.555</b>	<b>100</b>

*Source: Indonesian Outlook of Zakat 2020*

The Zakat Management Law No. 23 of 2011 defines zakat management as the planning, implementing, and coordinating activities in zakat's collection, distribution, and use. The LAZ is formed from the initial community (Achmad, 2022).



However, the collection of zakat funds by some LAZs in Indonesia continues to increase each year (Kartikasari, 2020). This is according to Indonesia Zakat Outlook 2021 published by BAZNAS. The chart below shows that zakat's annual average growth rate from 2002 to 2019 was 34.33%.



Picture 1: Growth of zakat in Indonesia (Indonesia Outlook of zakat 2021)

The growth of zakat in Indonesia, which has continued to increase in recent years, is due to the power of the zakat administration (Herianingrum et al., 2024). The zakat administration organization's efficiency level is used to look at the level of professionalism and accuracy in the administration and administration of zakat itself (Saad et al., 2023).

Efficiency is defined as a comparison of job output and input. Outputs are the expected results from managing inputs (Safiullah & Shamsuddin, 2022). However, input is a resource used in the job's process. By fixing the input and increasing the output, effective use of the input means the system's effectiveness (Ningsih & Yuliana, 2022). On the other hand, if the output produced is constant and the input given can be reduced, it can be considered efficient (Munfaati et al., 2022).

In the era of Industrial Revolution 4.0 development and advances in information technology, digital systems are being used in various fields to speed

up, streamline, and extend access in the workplace (Khairrani et al., 2022). The use of financial technology in managing zakat has a positive impact (Herianingrum et al., 2024). The digitization of zakat management will also affect zakat collection and distribution transparency, allowing *Muzakki* (Muslims who are obliged to pay zakat) to know the zakat funds collected and the number distributed to the *Mustahik* (a person who receives zakat) (Achmad, 2022). The Data Envelopment Analysis (DEA) method is an efficiency measurement solution that requires multiple inputs and outputs without converting values to the same units. Most users of DEA techniques are non-profit organizations or businesses, such as schools and social institutions. The efficiency of these organizations is compared to commercial organizations based on the number of profits made.

Thus, this research focuses on increasing the effectiveness of zakat management institutions by applying financial technology, a modern approach to zakat management. Although fintech brings automation to increase efficiency, its success depends on the clarity of organizational policies and goals. Good management remains a crucial factor for fair management of zakat funds. Effective collaboration with external entities, including financial institutions, can strengthen fintech infrastructure. Therefore, apart from fintech, these considerations must also be taken into account to optimize zakat institutions under the principles of the Quran.

## LITERATUR REVIEW

### Efficiency Paradigm

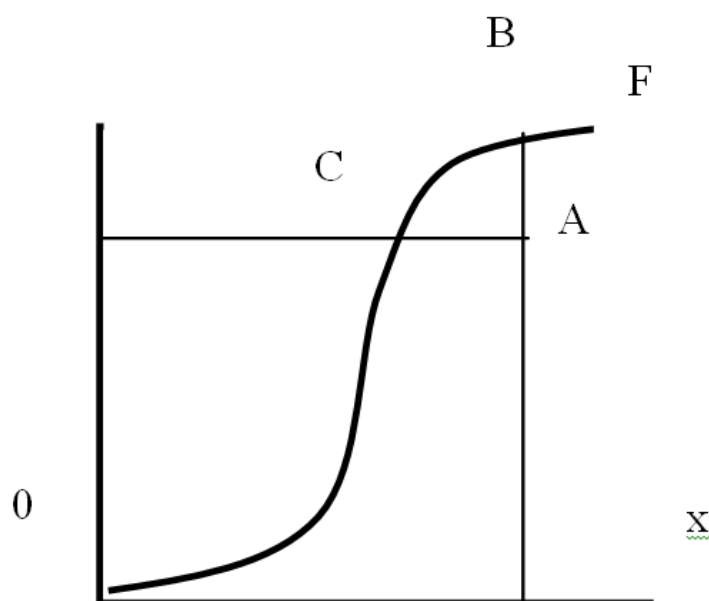
Efficiency is an operating parameter that underlies an organization's overall performance. In general, efficiency is the ability of a company to produce as much output as possible with a smaller proportion of its input resources. The concept of efficiency measurement, which already exists today, was devised by Mawardi et al., (2023) and is a further work development by Debreu da Koopmans (Isam & Oumaima, 2022). Efficiency theory is closely related to the production and consumption theory of microeconomics (York et al., 2022). Manufacturers tend to minimize costs and expect high profits. Alternatively, above-average performance can be achieved if the cost is the standard (Yu & Sun, 2022). Consumption theory, on the other hand, seeks to maximize happiness with a limited budget (Khan, 1994).



In measuring organizational efficiency, Farrell uses a variety of inputs and divides efficiency into two forms: technical efficiency and allocative efficiency. Technical efficiency can be measured by how much input is used and how much output is successfully generated without knowing the price of inputs or outputs. On the other hand, allocative efficiency calculates the output a firm achieves based on the proportion of inputs used in the price structure and the technology used for those inputs (Endri et al., 2022).

Islam promotes a continuous pursuit of righteousness, altruistic service to others, and responsible use of financial resources. The concept of efficiency in Islam is understood as the result of best use and charity. This means that Muslims should be able to benefit themselves and others by not wasting their time and doing useless things (Khan, 2020).

The following diagram illustrates efficiency.



Picture 2: Diagram of Efficiency (Sources: Coelli, 1996)

Based on the diagram above, point A represents an inefficiently operated company. From a technical perspective, by adjusting the position of point A, it

is possible to get a higher output (Y) at point B without the need for more input (x). Point X can also be generated at point C. Specifically, the utilization of inputs shifted to point C is reduced for the same outputs.

Data envelopment analysis is an efficiency measurement method that does not use parametric techniques. Data envelopment analysis does not require specific functional relationships and does not assume that all organizations are technically efficient. The advantage of this method is that it can show the value of the efficiency of the organization. In this way, it is called a decision-making unit (DMU) or interpreted as a decision-making unit about other organizations. Therefore, it can represent the most efficient organization (Chan et al., 2022).

### **Basic Law of Zakat**

Zakat is binding and obligatory for all Muslims. The mentioned position is not a compulsory recommendation but rather a key element of the Islamic character. This obligation is not restricted by age or mental state. The primary condition for issuing zakat is that the *nishab*, which is the minimum wealth a Muslim must have after expenses deduction for contributing zakat, contains assets. Therefore, some of these assets must be given to zakat to Mustahik (Latief, 2022).

Some scholars explained the definitions of zakat. For instance, in the opinion of Al-Hafidz Ibn Hajar, zakat is a form of worship carried out by giving similar assets that have reached the size or nishab for one year and given to Mustahik such as indigent people or the like who are not from the Bani Hasyim and Muthalib. Furthermore, Hujjatul Islam Ibnu Taimiyah defines zakat as a worship activity performed by giving a particular portion of the wealth that may increase when the nishab is reached (Hidayatullah, 2018).

Zakat, as one of the main pillars in Islamic teachings, has eight groups of recipients which are explained in the Qur'an in surah At-Taubah (9:60). Zakat recipients include *fuqara* (poor people), *masakin* (people who need economic assistance), *'amilin* (workers who handle zakat collection and distribution), *muallaf* (people who have recently converted to Islam or are sympathetic to Islam), *riqab* (people who need to free themselves from slavery or debt), *gharimin* (people who are in debt for legitimate needs), *fisabilillah* (people who struggle in



the way of Allah), and *ibn sabil* (travelers or people who are on a journey). Muslim communities are expected to fulfill their zakat obligations by distributing them to the eight groups, thereby creating social justice and support for those in need (Firdaningsih et al., 2019).

In accordance with Indonesian legislation, zakat is defined in two ways. Firstly, according to Law No. 23 of 2011 on Zakat Administration, and secondly, as defined in the Compilation of Shariah Economic Law (Murwenie et al., 2021). Thus, zakat is the duty of Muslims, both as individuals and as an organization, to give a portion of their wealth to those entitled under Sharia regulation.

The Qur'an and hadith fragments above mention the word zakat after prayer. In Islamic law sources, some of our teachings always mention two of his commandments. This means that one command followed by another is essential as a whole, and a command is only complete if it is executed after it. The combination of prayer and the word zakat in various verses has essential meanings. The commandment of prayer confirms that on the spiritual plane, a person is personally a servant of the Lord (Abdullah). On the other hand, zakat is used as an adjunct to prayer to realize the human being (Khalifatullah) as a social being in moral and ethical dimensions (Javed et al., 2018).

### **Amil and Zakat Management**

Amil is one of the groups of Eight (*Asnaf*) that is the target of zakat beneficiaries. However, *Amil* is a position appointed by the relevant agency or government to manage, control, collect, and distribute zakat. A group of economically capable people may appoint Amil. However, Amil is still one of the *asnaf* who is entitled to receive zakat to uphold Islamic teachings and aims to maximize zakat in such a way as to ignore personal gain (Arwani et al., 2022).

In the context of *fiqh*, Amil is the person who has the power to administer zakat and is obliged to collect assets from their owners and distribute them to qualified persons when delegated by the authorities. In the Qur'an, Amil is mentioned as third among his eight *asnaf* who were eligible to receive zakat, indicating Amil's importance in the process of distribution and collection of zakat (Bakir, 2021).



According to BAZNAS regulations, Amil is entitled to receive up to 12.5%, or 1/8 of the total zakat collection, as stated in the decree issued by the BAZNAS Advisory Board (Sudarsono et al., 2021). Ulama stipulates that Amil's share of zakat is one-eighth of his accumulated wealth, so this amount cannot be higher.

Zakat-collecting is the activity performed by the Amil to collect zakat from the Muzakki, not only by individuals but also by companies, institutions, and institutions obligated to pay zakat (Zein et al., 2020). Zakat collection can be found in different regions and even abroad. The collection of zakat is now divided into several activities that differ according to the programs of each Amil in the LAZ (Hudaifah et al., 2020).

Currently, ICT is used for the purposes of zakat administration, online services, and reporting. However, it is not utilized for collaboration yet. A proposed 3C model (communication, coordination, cooperation) suggests leveraging ICT for effective collaboration (Mutamimah et al., 2021). Increasing Amil's quality and capacity, especially in the technological aspect, is a priority solution (Widiastuti et al., 2021). Focused group discussions validate this ICT-based collaborative framework as a strategy to enhance zakat management, emphasizing improved communication, coordination, and cooperation for better outcomes.

### **Financial Technology (FinTech)**

Today, financial technology is often defined as financial technology (Fintech), a common term in society. When considering digital technology, one often associates it with effectiveness and efficient processes achieved through numerical statistics and internet networks. In finance, digital technology is the ease of transactions, including loans, payments, money transfers, investments, and others, quickly and easily. Fintech is the advancement and innovation that can bring convenience to financial services and reach more people overall (Rabbani, 2023).

The emergence of fintech companies is influenced primarily by two reasons. First, the global financial crisis of 2008 showed bankers that the conventional financial system was flawed. Second, technological developments will facilitate mobility and access, reducing service costs (Pu et al., 2021).





The development of fintech is driving innovations in banking and finance. These financial institutions, such as banks, the capital industry, insurance companies, pension funds, and pawn shops, provide clear examples of this phenomenon. The Internet provides convenience through service changes and efficiencies in the financial services sector (Feng et al., 2022).

### **Data Envelopment Analysis (DEA)**

Data Envelopment Analysis (DEA) is a nonparametric efficiency measurement method that calculates the technical efficiency of all units. The DEA method is an evolution of linear programming in power measurements with a single input and output. DEA is designed to simultaneously measure more inputs and outputs, which is impossible with linear programs (Fotova Čiković & Lozić, 2022).

To explore efficiency, look at results calculated using DEA. Efficiency ratings depend on the level of efficiency score for each unit in the sample. The score for each unit in the sample ranges from 0 to 1, with no negative values. A value of 1 indicates a fully efficient value. A unit with a value of 1 is used as a reference for measuring the efficiency level of other units with inefficient values. Units with values less than one are said to be inefficient (Molinos-Senante & Maziotis, 2022).

This method was introduced and first developed by Farrell (1957). Farrell created a limit analysis technique that describes efficiency with two inputs and one output. Subsequently, Charnes et al. (1978) and Banker et al. (1984) went further than what was previously done by Farrell. The idea of a two-input, one-output technique has the drawback that it is impossible when there are many inputs and outputs. In addition, Charnes et al. and Banker et al. It has evolved into two existing models (Awlaqi & Aamer, 2022).

There are two types of DEA computational models that represent the basic model for measuring efficiency:

Charnes, Cooper, and Rhodes started the first model; this model is called CCR. The second is the model initiated by Banker, Charnes, and Cooper, the so-called BCC model. The difference between these two models is the assumptions used. The CCR model assumes that adding a value to the input  $n$  times adds  $n$  outputs  $n$  times. It provides additional outputs but can generate



more considerable/minor additions called Variable Return to Scale (VRS) (Iqbal Hussain et al., 2022).

In general, the DEA can only measure relative efficiency, not absolute efficiency. This technique also has the disadvantage that hypothesis testing cannot be performed statistically as it is nonparametric. Additionally, efficiency measurements are performed simultaneously for multiple DMUs (Stević et al., 2022).

## RESEARCH METHOD

### Technical Efficiency Measurement by DEA

Efficiency studies in the zakat system still need to be discussed more in economic research. Efficiency calculation techniques using DEA are more commonly used in banking institutions and the industrial sector. On the other hand, if we calculate the efficiency of the zakat system, it is relatively minor.

As the approach used in this study is a production approach, this study uses the main variables: funds received and distributed and costs. Specifically, we use the Operational Cost (X1) and Socialization Cost (X2), the benchmarks zakat institutions use to run their businesses to collect zakat. On the other hand, the performance details of zakat institutions are measured by the sum of funds collected and distributed as Y1 and Y2.

$$Efisiensi DMU_0 = \frac{\sum_{k=1}^p \mu_k Y_{kj}}{\sum_{i=1}^m v_i X_{ij}}$$

This program is user-friendly since it does not need installation on the computer. Therefore, using a production approach, this study uses Data Envelopment Analysis Program (DEAP) Version 2.1 to calculate the effectiveness of the four ZMOs (Zakat Management Organization) implementing digital payment financial technology from 2018-2020. The zakat system is considered



adequate when the analysis results score one and become increasingly ineffective as the score approaches 0 or falls below 1.

## RESULTS AND DISCUSSION

### Results

In this study, we selected 4 ZMOs from 30 LAZs registered in BAZNAS. The 4 ZMOs used as examples are the top four most popular ZMOs published by Alexa.com Ratings, which regularly publishes a list of popular and frequently visited websites in Indonesia. Alexa.com ranks websites based on several visits, length of page views in the last three months, and the number of links clicked and visited. After collecting data, each website can be ranked globally or in specific categories. Below is a list of 13 LAZs sorted by rank, published by Alexa Traffic Rank on June 17, 2020.

LAZ under BAZNAS officially tracks 34 LAZs, but only 13 LAZs are nominated as the most popular LAZ websites listed in Alexa's traffic rank list. The picture above depicts the number 4 as his ZMO. BAZNAS (BAZNAS.go.id), NU Care (nucare.id), Dompot Dhuafa (dompetdhuafa.org), and Rumah Zakat (rumahzakat.org) are the four leading LAZs, with the highest scores. The content is shown in the lowermost part. It has the highest rating. This research used ranking-based items to assess the efficiency of LAZ in our analysis.

**Table 2 : ZMO Efficiency Level Calculation**

No	DMU	CRS_TE	VRS_TE	SCALE	RTS
1.	BAZNAS 2018	0,35	0,37	0,96	DRS
2.	BAZNAS 2019	0,40	0,41	0,97	DRS
3.	BAZNAS 2020	0,47	0,49	0,95	DRS
4.	LAZISNU 2018	0,65	1,00	1,00	IRS
5.	LAZISNU 2019	1,00	1,00	1,00	CRS
6.	LAZISNU 2020	1,00	1,00	1,00	CRS
7.	Dompot Dhuafa 2018	0,25	0,42	0,60	DRS
8.	Dompot Dhuafa 2019	0,33	0,55	0,61	DRS
9.	Dompot Dhuafa 2020	0,45	0,53	0,86	DRS



10.	Rumah Zakat 2018	0,28	0,30	0,95	DRS
11.	Rumah Zakat 2019	0,38	0,39	0,98	DRS
12.	Rumah Zakat 2020	0,40	0,42	0,97	DRS
	<b>Average</b>	<b>0,50</b>	<b>0,57</b>	<b>0,87</b>	

Source: Output DEAP 2.1, Analysis.

The table above has four components that are the result of efficiency measurements. These are CRS efficiency, VRS efficiency, scale efficiency, and regression to scale (RTS). The table above shows that only two of his DMUs in NU Care in 2019 and 2020 have overall efficiency (all hypothetical efficiency ratings of 1) in IRS terms, as shown in the 2018 DMU of NU Care. The output can be optimized with the same input. On the other hand, the other nine DMUs had non-ideal relationships between their inputs and outputs, indicating the need to have fewer inputs or produce more significant outputs with the same number of inputs. The trend of efficiency levels for each ZMO over each period is increasing. The distribution and collection of zakat in 2020 is more efficient than the previous year, except for the efficiency level of Dompot Dhuafa, which fell to 0.53, reflecting a decrease in the distribution of zakat compared to the previous year. Consider the distribution table below.

**Table 3 : Distribution Efficiency Level of ZMO**

Assumptions	1,00	0,99 - 0,80	0,79 - 0,60	0,59 - 0,40	0,39 - 0,00
CRS	2	0	1	4	5
VRS	3	0	0	6	3
SCALE	3	7	2	0	0

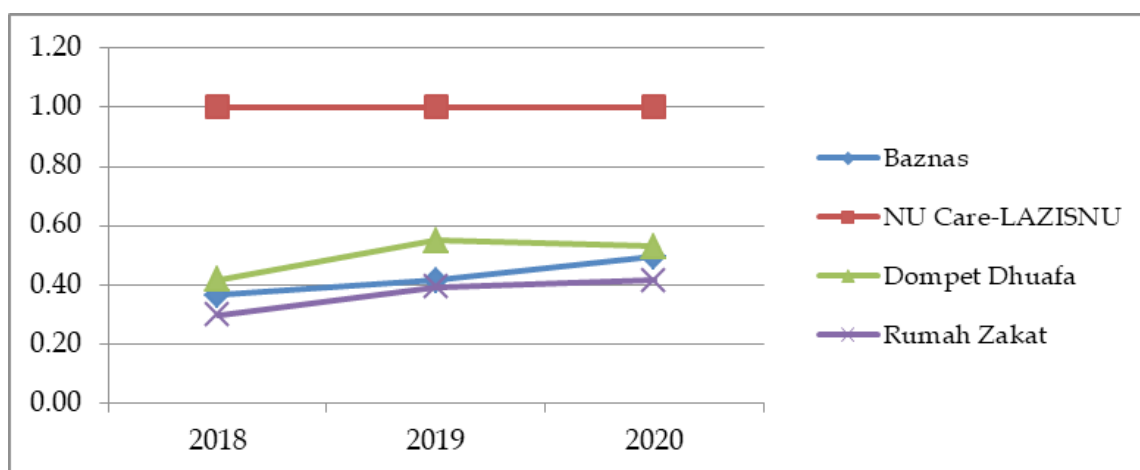
Source: Output DEAP 2.1, Analysis.

Table 3 shows that out of 12 DMUs based on technical efficiency, assuming the VRS scale efficiency scale, 3 or 25% of the DMUs have efficient values. The remaining 9 DMUs have VRS values less than 1, so they assume VRS is inefficient (inefficient). This means that 75% of diesel railcars still need to improve efficiency.



Data processing results of four FinTech-based ZMOs in 2018, 2019, and 2020 simultaneously show which ZMOs are efficient and which are inefficient. Technically, NU Care is an efficient ZMO compared to other ZMOs, with an efficiency score of 1 from 2018 to 2019. The ZMO with the lowest efficiency level from 2018 to 2020 was Rumah Zakat in 2018, but it continued to increase in the following years. In 2020, Dompot Dhuafa decreased after increasing from 2018 to 2019. BAZNAS, as a national ZMO, continues to improve its efficiency score during this period.

**Picture 2: Comparison Efficiency Level of ZMO**



Source: Excel Analysis.

Analyzing the efficiency of the DEA process using DEAP 2.1 software provides a general efficiency calculation. On the other hand, researchers are able to conduct additional inquiries by precisely displaying the outcomes of calculations per DMU. In other words, one can determine whether a more efficient DMU can be generated by increasing outputs or decreasing inputs (radial and slack) in order to utilize the reference DMU. This can be examined by considering the following table.

**Table 4 : Peer the Lambda's ZMO Level**

<b>DMU</b>	<b>Technical Efficiency</b>	<b>Peer</b>	<b>Lambda</b>
BAZNAS 2018	0,37	5	0,352
BAZNAS 2019	0,41	6	0,749
BAZNAS 2020	0,49	6	1,000
NU Care 2018	1,00	4	1,000
NU Care 2019	1,00	5	1,000
NU Care 2020	1,00	6	1,000
Dompot Dhuafa 2018	0,42	6	1,000
Dompot Dhuafa 2019	0,55	6	1,000
Dompot Dhuafa 2020	0,53	6	1,000
Rumah Zakat 2018	0,30	5	0,030
Rumah Zakat 2019	0,39	5	0,434
Rumah Zakat 2020	0,42	5	0,267

Source: Output DEAP 2.1, Analysis.

NU Care in 2018, 2019, and 2020 will be the reference (peer) of other less efficient DMUs as the most efficient DMU among the above 12 DMUs. Each DMU's peer has a lambda value that can be used as a benchmark for linking reference DMUs to inefficient DMUs. Each DMU's score depends on the impact of the inefficient DMU on its reference DMU (Ang et al., 2021). For example, DMU 1, BAZNAS 2018, with an efficiency value of 0.37, describes BAZNAS 2018 as inefficient. In Table 4.3, DMU 5, NU Care is identified as a BAZNAS peer in 2018 (reference), with a lambda value of 0.352 in 2019. BAZNAS should decrease its input in 2018 and enhance its output by a factor of 0.352, or about 35% more than NU Care in 2019, in order to improve efficiency.

DEA calculations using DEAP 2.1 software are better for some specific DMUs with specific values than calculations for values produced by inefficient DMUs (values less than 1). It provides a description that generates each component (Pujianto & Kristianingsih, 2020).



The original value (OV) measures the initial input and output efficiency. Radial movement (RM) is a value that represents several critical references as a reference for more efficiently achieving the predicted outcome goals. RM is the value that must be added to the input or output to change the efficiency value so that the result approaches the equivalent value. Then, there is a component called slack movement (SM), a small value with the same functionality as RM, so the efficiency opportunities are more significant. A predicted value (PV) is then generated by adding the references using RM and SM. This is the number of predictions that should be generated to change the inefficient input or output values.

## Discussion

### BAZNAS

The data processing results conducted in the national ZMO, BAZNAS, show that the efficiency values of BAZNAS show improved efficiency in 2018, 2019, and 2020. The value of distributing and collecting zakat continues to increase over time. However, compared to its peer ZMO in this study, BAZNAS should have a higher potential zakat yield than its actual performance figures.

**Table 5: Original Value, Radial Movement, Slack Movement, and Projected Value of BAZNAS (in billions)**

DMU	VAR	OV	RM	SM	PV
BAZNAS 2018	Collected	206374	359776	121814	687964
	Distributed	235665	410840	0	646505
	Operational	8432	0	0	8432
	TE = 0,37	Sosialization	8586	0	-7307
BAZNAS 2019	Collected	296234	418545	0	714779
	Distributed	270717	382492	17796	671005
	Operational	8786	0	0	8786
	TE = 0,41	Sosialization	15282	0	-13962
BAZNAS 2020	Collected	386204	395536	0	781740
	Distributed	326156	334037	71994	732187
	Operational	9869	0	-199	9670
	TE = 0,49	Sosialization	17239	0	-15815

Source: Output DEAP 2.1, Analysis.

Table 5 shows that BAZNAS generally has reduced regression to scale (DRS) compared to its peers (DMU 5 and DMU 6 as reference DMUs). Therefore, in 2018, the zakat collection should be increased from the actual income to IDR687.9 billion. Apart from that, we also need to reduce socialization costs by up to IDR7.3 billion. Then, in 2019, the BAZNAS forecast also increased to IDR714.7 billion, reducing the socialization cost contribution by IDR13.9 billion. In 2020, BAZNAS will have to increase the output of zakat distribution, which previously he had only IDR326.1 billion, to IDR732.1 billion, and reduce inputs, especially operational costs, by IDR119 million.

Based on the results of data processing by DEA, the sales forecast for BAZNAS should reach IDR700 billion. However, the realization is only about IDR300 billion, as his ZMO nationwide, whose operations are funded by the State Budget (APBN, *Anggaran Pendapatan dan Belanja Negara*) for BAZNAS, should be able to maximize the issuance of zakat income and distribution. The factors behind the low rate of zakat collection in BAZNAS are related to the system being a ZMO where BAZNAS is the operator and the ZMO in its role as regulator, and the focus of BAZNAS is zakat (Aziz, 2019, p. 20). Distribution could be more effective. It is to collect zakat and regulate and supervise his other ZMO (Al-Ayubi et al., 2018).

During the COVID-19 outbreak, many policies and operating systems have been adjusted to continue to provide the best zakat service. Innovation in digital zakat payment continues to grow by working with digital service platforms to make it easier for people to pay zakat (PUSKAS, 2019).

## NU Care

DEAP 2.1 data processing at NU Care showed that this ZMO had a perfect efficiency level of value 1 in 2018, 2019, and 2020, based on CRS, VRS, and scale assumptions (Table 3). As a result, ZMO is more efficient overall (inputs and outputs are used optimally).





**Table 6: Original Value, Radial Movement, Slack Movement, and Projected Value of NU Care (in billions)**

DMU	VAR	OV	RM	SM	PV
NU Care 2018 TE= 1,00	Collected	294859	0	0	294859
	Distributed	286299	0	0	286299
	Operational	5587	0	0	5587
	Sosialization	6866	0	0	6866
NU Care 2019 TE=1,00	Collected	515486	0	0	515486
	Distributed	488913	0	0	488913
	Operational	6155	0	0	6155
	Sosialization	1012	0	0	1012
NU Care 2020 TE=1,00	Collected	781740	0	0	781740
	Distributed	732187	0	0	732187
	Operational	9670	0	0	9670
	Sosialization	1424	0	0	1424

Source: Output DEAP 2.1, Analysis.

Table 6 provides information that NU Care, as an efficient DMU, has collected and distributed zakat with ideal use of funds for three years. Therefore, NU-Care LAZISNU has no other peer DMUs to refer to since the DMU itself serves as the reference for its effectiveness. The Radial Movement (RM) and Slack Movement (SM) columns provide this information with zero values. Each input and output is fully utilized; thus, adding or subtracting configurations is unnecessary. Input and output values for 2018, 2019, and 2020 are balanced, with additional inputs for socialization and operational costs likely to increase spending on zakat receipts and distributions. In 2018, IDR5.5 billion in operating costs and IDR6.8 billion in socialization costs can generate IDR294.8 billion zakat income and distribute IDR286.2 billion zakats. In 2019, operational and socialization cost inputs amounted to IDR7.1 billion, and zakat's revenue reached IDR515.4 billion. 2020 zakat distribution continues to grow to IDR732.1 billion at an input cost of IDR11 billion.

NU Care is a zakat agency based in an Islamic community organization with extensive networks. NU Care is a zakat institution owned by Nahdlatul Ulama, Indonesia’s largest prominent Islamic mass organization, with a population of 90 million and branches abroad. NU Care has 1 million volunteers across Indonesia, with servers across 24 states and 388 specialized branches worldwide. NU Care’s zakat collection and distribution are, of course, very efficient.

The Ziswaf of NU Care program offers distinct benefits in comparison to other ZMOs. This allows for accurate selection of Muzakki and donors down to the village level and implements digitalization of payments via barcodes and e-commerce. Apart from that, from an operational point of view, NU Care already has a structured organization in each region, which can reduce costs or inputs incurred and maximize outputs achieved. As such, its members are assured of paying zakat, *infaq*, or alms in this ZMO without the need to provide extensive instruction or publicity (Rachmawati et al., 2022)

### Dompot Dhuafa

A popular zakat administration organization in Indonesia experienced inefficiencies of 0.43, 0.55, and 0.53 consecutively from 2018 to 2020. The efficiency score dropped by 0.2 in 2020 (See Table 4.6 below).

**Table 7: Original Value, Radial Movement, Slack Movement, and Projected Value of Dompot Dhuafa (in billions)**

DMU	VAR	OV	RM	SM	PV
<b>D o m p e t D h u a f a 2018</b>	<b>Collected</b>	325237	456503	0	781740
	<b>Distributed</b>	276758	388457	66971	732187
	<b>Operational</b>	15651	0	-5981	9670
	<b>Sosialization</b>	23359	0	-21935	1424
<b>TE = 0,42</b>					
<b>D o m p e t D h u a f a 2019</b>	<b>Collected</b>	397245	327619	56875	781740
	<b>Distributed</b>	401258	330929	66971	732187
	<b>Operational</b>	15118	0	-5981	9670
	<b>Sosialization</b>	12205	0	-21935	1424
<b>TE = 0,55</b>					



<b>D o m p e t D h u a f a 2020</b>	<b>Collected</b>	412826	368914	0	781740
	<b>Distributed</b>	353827	316190	62169	732187
	<b>Operational</b>	10906	0	-1236	9670
	<b>Socialization</b>	8914	0	-7490	1424
<b>TE = 0, 53</b>					

Source: Output DEAP 2.1, Analysis.

Revenue continued to grow from 2018 to 2020 but has decreased to IDR353.8 billion from IDR401.2 billion in the previous year, considering the distribution of zakat from Dompét Dhuafa in 2020. Additionally, as an inefficient ZMO, Dompét Dhuafa still needs to increase output and reduce input. From efficiency calculations for 2018, 2019, and 2020, Dompét Dhuafa can potentially increase zakat's income collected by IDR781.7 billion by minimizing the inputs used. In 2018, Dompét Dhuafa's information was needed to reduce operating costs of IDR5.9 billion and socialization costs of IDR21.9 billion. In addition, in 2019, we will be able to reduce operating costs by IDR5.9 billion and reduce socialization costs by IDR21.9 billion. Moreover, IDR1.2 billion in operational cost savings and IDR7.4 billion in socialization cost savings are needed in 2020.

The factor affecting the inefficiency of Dompét Dhuafa is the imbalance between income and distribution; the output of operating and socialization costs is very high, but the maximum gain and distribution are balanced. The reason is that this ZMO is not organization-based; therefore, Dompét Dhuafa needs a stable donor base. In order to compete with the other ZMOs in the same category, Dompét Dhuafa conducts many promotions and improves the quality of its services as a result of the demands for enhancement. Due to the many private ZMOs in Indonesia, the impact on competition among ZMOs is becoming more severe (Mawardi et al., 2023).

## Rumah Zakat

Rumah Zakat ZMO's DEA tester results showed that the lowest efficiency occurred in 2018 at a value of 0.30, rising to 0.39 in 2019 and 0.42 the following year. This means that the ZMO exhibits an efficiency trend that continues to

increase during this study period. However, it is classified as an inefficient ZMO compared to its reference DMU, NU Care.

**Table 8: Original Value, Radial Movement, Slack Movement, and Projected Value of Rumah Zakat (in billions)**

DMU	VAR	OV	RM	SM	PV
Rumah Zakat 2018	Collected	216570	368914	45615	773786
	Distributed	215603	316190	0	724919
	Operational	9565	0	0	9565
	Sosialization	4129	0	-2717	1411
TE = 0,30					
Rumah Zakat 2019	Collected	261791	404357	0	666148
	Distributed	238522	368416	19633	626572
	Operational	8144	0	0	8144
	Sosialization	4080	0	-2834	1245
TE = 0,39					
Rumah Zakat 2020	Collected	294985	415627	0	710612
	Distributed	271694	382811	12693	667198
	Operational	8731	0	0	8731
	Sosialization	4503	0	-3189	1313
TE = 0, 42					

Source: Output DEAP 2.1, Analysis.

The table above shows the amount of Radial Movement (RM) and Slack Movement (SM) added or subtracted to the DMU input and output for 2018, 2019, and 2020 by Rumah Zakat to generate ZMO. The efficiency of Rumah Zakat is commendable. In the first year, the RM figure that needs to be added to make Rumah Zakat Revenue efficient is IDR368.9 billion, and another IDR45.6 billion can be added to make it even more efficient. The distribution must also increase by IDR316.1 billion, so the extrapolation is IDR724.9 billion. In 2019, sales performance was anticipated to increase to IDR666.1 billion, compared to 261.7 billion. By including RM and SM, the distribution has the potential to reach a significant amount of IDR626.5 billion. In 2020, the amount of zakat revenues and distributions is expected to exceed IDR710.6 billion potentially.



Regarding the inputs used, the ZMO of Rumah Zakat has achieved operational cost efficiency, so there is no need to reduce operating costs. However, minimizing the socialization costs of IDR2.7 billion from 2018 to 2020, IDR2.8 billion next year, and IDR3.1 billion last year is necessary.

Rumah Zakat is classified as a ZMO that does not belong to any particular community or organization. Rumah Zakat has to pay much money for promotion and operation. Compared to BAZNAS and NU Care, private ZMOs have to compete with similar ZMOs to increase their receipt and distribution of the zakat they receive. Competition among ZMOs can positively impact them, leading to innovation and improved services. Nevertheless, on the other hand, it can be a waste of money (Arwani et al., 2022).

### **Analysis Using Hahslm Theory**

The approach articulated by Hahslm suggests that scientific knowledge originated from Islam as a holistic system based on the compatibility of methods with universal acceptance in society (Aziz, 2015). This idea reflects the notion that scientific knowledge and Islamic values can be harmoniously integrated, as seen in the contributions of Muslim scholars during a specific historical period when the Islamic world served as a center for intellectual and scientific activities. However, this perspective is only sometimes accepted, and there is variation in approaches to the relationship between science and religion among Islamic scholars and society.

Based on the data analysis results, ZMO could be more efficient due to the suboptimal use of socialization and operating cost inputs. Moreover, the output produced by ZMO has yet to reach the expectations that should have been achieved using existing inputs.

Therefore, from an Islamic point of view, some teachings are derived from the Qur'an and the Hadith of Prophet Muhammad SAW for optimizing the input and output of work.

#### **1. Optimizing Inputs**

One way to maximize input is to avoid extravagant and stingy behavior and adjust output (Khan, 2020). As the Qur'an states, waste is

called *tabzir* (wastefulness) in Islam, and the one who commits waste is called *Mubadzirin*.

ان المبذرين كانوا اخوان الشيطان وكان الشيطان لربه كفورا

Translation: «Those who squander are the brothers of Satan, and Satan is most ungrateful to his Lord-» QS. Al-Isra' [17]: 27 (The Qur'an, 2004).

According to Ibnu Mas'ud, *tabdzir* gives property to someone else as his right. In other words, when spending money and possessions, one should not overdo it (*Ishraf*) and use controls in a balanced way (Parhan et al., 2022).

Balanced spending of wealth is also mentioned in another verse.

ولا تجعل يديك مغلولة الى عنقك ولا تبسطها كل البسط فتتعد ملوما مسحورا

Translation: "Do not be tight-fisted, nor so open-handed that you end up blamed and overwhelmed with regret" QS. Al-Isra' [17]:29 (The Qur'an, 2004).

Imam Nawawi, in his book *Qomi'ut Tughyan*, states that the meaning of the above verse is: Do not be too extravagant in giving wealth, because withholding too much wealth leads to regret, and spending too much wealth (without control) leads to misery (Ahmad Muzakki, 2022).

## 2. Optimizing Outputs

Specialization is necessary to reduce inefficiencies caused by the inappropriate division of labor. In the production process, attention should be paid to the ability of workers to perform their jobs and to avoid careless and unprofessional performance of the tasks assigned to them (Dwi & Ali, 2022).

ان الله يامرکم ان تؤدوا الامنت الى أهلها



Translation: «God commands you [people] to return things entrusted to you to their rightful owners...» QS. An-Nisa [4]: 58 (The Qur'an, 2004).

By dividing the labor, it becomes possible to perform work according to each person's specialty and uniqueness, and it becomes possible to achieve optimal position, which increases production volume (Alhamdi et al., 2022). As a result, the division of labor leads to efficiency.

## CONCLUSION

Based on the results of the data analysis in this study, it is concluded that NU Care stands out as the sole consistently efficient fintech-based Zakat Management Organization (ZMO) throughout the study period. Conversely, BAZNAS, Dompot Dhuafa, and Rumah Zakat show signs of inefficiency. The inefficiency levels, based on the Variable Returns to Scale (VRS) assumption, reveal that three DMUs had an inefficiency level of 1, six DMUs had a level less than 0.60, and three DMUs had a level less than 0.40, with Dompot Dhuafa experiencing a decline in efficiency in 2020. Overall, there is a general upward trend in DMU efficiency levels.

Various factors contribute to the efficiency and inefficiency levels of ZMOs, such as differences in donor bases, costs, performance imbalances, competition among ZMOs sharing the same donor base, and the dual roles of some ZMOs as operators and regulators. The regulatory body should emphasize regulatory functions rather than direct involvement in zakat collection or extensive use of financial technology for zakat activities.

In optimizing ZMO efficiency, the Hahslm theory suggests aligning operations with Quranic principles. This entails revisiting the Quran and incorporating the desired efficiency values outlined in the holy book. The optimization process should be in accordance with Quranic principles, emphasizing the importance of controlling expenses and maximizing income through professional management.

## REFERENCES

- Achmad, W. (2022). Corporate Social Responsibility and Zakat: A Model of Philanthropy in the Society Era 5.0. *Jurnal Scienta*, 11(1), 565–574.
- Ahmad Muzakki. (2022). Menggali Nilai-Nilai Islam Wasathiyah Dalam Kitab-Kitab Pesantren Sebagai Modalitas Mewujudkan Perdamaian Dunia. *Humanistika : Jurnal Keislaman*, 8(2), 176–203. <https://doi.org/10.55210/humanistika.v8i2.833>
- Al-Ayubi, S., Ascarya, & Possumah, B. T. (2018). Examining the Efficiency of Zakat Management: Indonesian Zakat Institutions Experiences. *International Journal of Zakat*, 3(1), 37–55. <https://doi.org/10.37706/ijaz.v3i1.66>
- Alhamdi, R., Sugianto, S., & Siregar, S. (2022). Optimization of Sharia Bank Cuan in the Industrial Era 4.0. *International Journal of Educational Review, Law And Social Sciences (IJERLAS)*, 2(1), 9–20. <https://doi.org/10.54443/ijerlas.v2i1.128>
- Arwani, A., Salenussa, S., Rahayu, N. W. I., Faiz, M. F., Cakranegara, P. A., Aziz, A., & Andiyana, A. (2022). The Development Of Economic Potential Of People In Pandemic Through Earning Zakat Distribution. *International Journal of Professional Business Review*, 7(2), 414. <https://doi.org/10.26668/businessreview/2022.v7i2.414>
- Awlaqi, M. A. A., & Aamer, A. M. (2022). Organisation Flexibility, Efficiency, and Sustainable Long-Term Performance: An Application of Data Envelopment Analysis and Relative Variety Analysis. *International Journal of Business Excellence*, 27(4), 529. <https://doi.org/10.1504/IJBEX.2022.125120>
- Aziz, R. M. (2015). Hahslm Islamic Economics Methodology. *International Conference On Social Economic And Culture*.
- Aziz, R. M. (2019). Efficiency Of Zakat Mmanagement Oorganizing (Opz) In Indonesia. *Jurnal Akuntansi Dan Auditing*, 26(1).
- Bakir, A. (2021). *Amil Zakat: Seri Hukum Zakat*. Hikam Pustaka.
- Chan, D. M., Mawengkang, H., & Nasution, S. (2022). Measurement of DEA-Based ICT Development Efficiency Level with Modified CCR Method. *Jurnal Varian*, 6(1), 97–104. <https://doi.org/10.30812/varian.v6i1.2197>





- Dwi, A. N., & Ali, H. (2022). Literature Review the Effect of Division of Work and Workload on Work Effectiveness and its Impact on Employee Performance. *Dinasti International Journal of Economics, Finance & Accounting*, 3(2). <https://doi.org/10.38035/dijefa.v3i2.1292>
- Endri, E., Fatmawatie, N., Sugianto, S., Humairoh, H., Annas, M., & Wiwaha, A. (2022). *Determinants of Efficiency of Indonesian Islamic Rural Banks. Decision Science Letters*. 11, 391–398. <https://doi.org/10.5267/dsl.2022.8.002>
- Feng, S., Zhang, R., & Li, G. (2022). Environmental Decentralization, Digital Finance and Green Technology Innovation. *Structural Change and Economic Dynamics*, 61, 70–83. <https://doi.org/10.1016/j.strueco.2022.02.008>
- Firdaningsih, F., Wahyudi, M. S., & Hakim, R. (2019). Delapan Golongan Penerima Zakat Analisis Teks dan Konteks. *Equilibrium: Jurnal Ekonomi Syariah*, 7(2), 316. <https://doi.org/10.21043/equilibrium.v7i2.5843>
- Fotova Čiković, K., & Lozić, J. (2022). Application of Data Envelopment Analysis (DEA) in Information and Communication Technologies. *Tehnički Glasnik*, 16(1), 129–134. <https://doi.org/10.31803/tg-20210906103816>
- Herianingrum, S., Widiastuti, T., Hapsari, M. I., Ratnasari, R. T., Firmansyah, F., Hassan, S. A., Febriyanti, A. R., Amalia, R. C., & Muzakki, L. A. (2024). Muzakki and Mustahik's Collaboration Model for Strengthening the Fundraising Capacity of Islamic Social Finance Institutions During COVID-19. *International Journal of Ethics and Systems*, 40(1), 175–188. <https://doi.org/10.1108/IJOES-05-2022-0091>
- Hidayatullah, S. (2018). *Ensiklopedi Rukun Islam: Zakat*. Al-Kautsar Prima Indocamp.
- Hudaifah, A., Tutuko, B., P., S. A., Ishaq, A. A., & Albar, M. (2020). *Synergy of Zakat Management in Indonesia*. Scopindo.
- Iqbal Hussain, H., Kamarudin, F., Mohamad Anwar, N. A., Sufian, F., Ali, A., & Saudi, M. H. (2022). Social Globalisation and Efficiency of Microfinance Institutions Nexus: Empirical Evidence on Financial and Social Efficiency. *Engineering Economics*, 33(1), 27–46. <https://doi.org/10.5755/j01.ee.33.1.29130>
- Isam, M., & Oumaima, R. (2022). The Measurement of Bank Efficiency. *International Scientific Conference on Economic and Social Development - 'Post-Covid Economy in Africa and Emerging Countries.'* <http://www.esd-conference.com>

- Javed, F. H., Nazar, A., & Asdullah, S. (2018). The Importance Of Coherence In Quranic Verses. *Journal of Positive School Psychology*, 6(9).
- Kartikasari, A. (2020). *Pengantar Hukum Zakat dan Wakaf*. Grasindo.
- Khairrani, A., Nikensari, S. I., & Iranto, D. (2022). Factors That Influence Social-Economic Motives Through The Decision Of Zakat To Use Digital Services (Case Study Of Laz Al Azhar). *International Journal of Multidisciplinary Research and Literature*, 1(6), 638–651. <https://doi.org/10.53067/ijomral.v1i6.63>
- Khan, M. A. (1994). *An Introduction to Islamic Economics* (2nd ed.). Zafar Sdn Bhd.
- Khan, M. A. (2020). *Theory of Consumer Behavior: An Islamic Perspective*. Munich Personal RePEc Archive Paper. <https://mpra.ub.uni-muenchen.de/104208/>
- Latief, H. (2022). Fatwa Pluralism on Zakat in Indonesia. *Journal of Muslim Philanthropy & Civil Society*, 6(2). <https://scholarworks.iu.edu/iupjournals/index.php/muslimphilanthropy/article/view/4688>
- Mawardi, I., Widiastuti, T., Al Mustofa, M. U., & Hakimi, F. (2023). Analyzing the Impact of Productive Zakat on the Welfare of Zakat Recipients. *Journal of Islamic Accounting and Business Research*, 14(1), 118–140. <https://doi.org/10.1108/JIABR-05-2021-0145>
- Molinos-Senante, M., & Maziotis, A. (2022). Prediction of the Efficiency in the Water Industry: An Artificial Neural Network Approach. *Process Safety and Environmental Protection*, 160, 41–48. <https://doi.org/10.1016/j.psep.2022.02.012>
- Munfaati, A., Noviarita, H., & Anggraini, E. (2022). Effects of Zakat and Government Debt on the Indonesian Economy. *Al-Kharaj : Jurnal Ekonomi, Keuangan & Bisnis Syariah*, 5(2), 772–788. <https://doi.org/10.47467/alkharaj.v5i2.1327>
- Murwenie, I., Fattah, N., Kusnendi, K., Sultan, M. A., & Wibowo, L. A. (2021). Muzakki's Commitment Improvement Model in Distributing ZIS Funds Through Prosocial Values Behavioral Approach. *Equilibrium: Jurnal Ekonomi Syariah*, 9(2), 217. <https://doi.org/10.21043/equilibrium.v9i2.10750>



- Mutamimah, M., Alifah, S., Gunawan, G., & Adnjani, M. D. (2021). ICT-Based Collaborative Framework for Improving the Performance of Zakat Management Organisations in Indonesia. *Journal of Islamic Accounting and Business Research*, 12(6), 887–903. <https://doi.org/10.1108/JIABR-05-2020-0154>
- Ningsih, S. W., & Yuliana, I. (2022). Analysis of Financial Performance Efficiency at the National Amil Zakat Agency (BAZNAS) East Java Province 2018-2020 Period Using Data Envelopment Analysis and the National Zakat Index. *Al-Kharaj : Jurnal Ekonomi, Keuangan & Bisnis Syariah*, 5(1), 142–152. <https://doi.org/10.47467/alkharaj.v5i1.1143>
- Parhan, M., Jenuri, J., Suwarma, D. M., Utari, R., Fitriah, A. G., & Damayanti, R. (2022). Hypebeast Trend on Consumption Behavior in Islamic Point of View. *El Harakah: Jurnal Budaya Islam*, 24(2), 337–354. <https://doi.org/10.18860/eh.v24i2.17881>
- Pu, R., Teresiene, D., Pieczulis, I., Kong, J., & Yue, X.-G. (2021). The Interaction between Banking Sector and Financial Technology Companies: Qualitative Assessment – A Case of Lithuania. *Risks*, 9(1), 21. <https://doi.org/10.3390/risks9010021>
- Pujianto, B. L. & Kristianingsih. (2020). Analisis Program Layanan Zakat Digital terhadap Penerimaan Zakat dengan Pendekatan Data Envelopment Analysis (DEA) pada Badan Amil Zakat Nasional. *Journal of Applied Islamic Economics and Finance*, 1(1), 15–22. <https://doi.org/10.35313/jaief.v1i1.2387>
- PUSKAS, B. (2019). *Indonesia Zakat Outlook (Issue December 2018)*. Center of Strategic Studies – The National Board of Zakat (PUSKAS BAZNAS).
- Rabbani, M. R. (2023). Fintech Innovations, Scope, Challenges, and Implications In Islamic Finance: A Systematic Analysis. *International Journal of Computing and Digital Systems*, 13(1), 1–15. <https://doi.org/10.12785/ijcds/130147>
- Rachmawati, E., Umniyatun, Y., Rosyidi, M., & Nurmansyah, M. I. (2022). The roles of Islamic Faith-Based Organizations on countermeasures against the COVID-19 pandemic in Indonesia. *Heliyon*, 8(2), e08928. <https://doi.org/10.1016/j.heliyon.2022.e08928>
- Saad, R. A. J., Ahmi, A., Sawandi, N., & Abdul Aziz, N. M. (2023). Zakat Administration Reformation Towards an Effective and Efficient Zakat

- Revenue Generation. *Journal of Islamic Accounting and Business Research*, 14(8), 1232–1260. <https://doi.org/10.1108/JIABR-05-2021-0151>
- Safiullah, M., & Shamsuddin, A. (2022). Technical Efficiency of Islamic and Conventional Banks with Undesirable Output: Evidence from a Stochastic Meta-Frontier Directional Distance Function. *Global Finance Journal*, 51, 100547. <https://doi.org/10.1016/j.gfj.2020.100547>
- Solihin, K., & Latifah, U. (2021). Technology and Community Based Zakat, Infaq, and Sodaqah Fundraising Model. *NU Santara Islamic Economic Journal*, 1(1), 26–39. <https://doi.org/10.34001/nuiej.v1i1.55>
- Stević, Ž., Miškić, S., Vojinović, D., Huskanović, E., Stanković, M., & Pamučar, D. (2022). Development of a Model for Evaluating the Efficiency of Transport Companies: PCA-DEA-MCDM Model. *Axioms*, 11(3), 140. <https://doi.org/10.3390/axioms11030140>
- Sudarsono, H., Nugrohowati, R. N. I., & Tumewang, Y. K. (2021). The Effect of Zakat Institution System and Government Support on Intention to Pay Zakat: Knowledge as A Moderating Variable. *Equilibrium: Jurnal Ekonomi Syariah*, 9(2), 253. <https://doi.org/10.21043/equilibrium.v9i2.11605>
- Widiastuti, T., Cahyono, E. F., Zulaikha, S., Mawardi, I., & Al Mustofa, M. U. (2021). Optimizing zakat governance in East Java using analytical network process (ANP): The role of zakat technology (ZakaTech). *Journal of Islamic Accounting and Business Research*, 12(3), 301–319. <https://doi.org/10.1108/JIABR-09-2020-0307>
- York, R., Adua, L., & Clark, B. (2022). The rebound effect and the challenge of moving beyond fossil fuels: A review of empirical and theoretical research. *WIREs Climate Change*, 13(4), e782. <https://doi.org/10.1002/wcc.782>
- Yu, J., & Sun, L. (2022). Supply Chain Emission Reduction Decisions, Considering Overconfidence under Conditions of Carbon Trading Price Volatility. *Sustainability*, 14(22), 15432. <https://doi.org/10.3390/su142215432>
- Zein, A. S., Lubis, D. S., & Sovia, A. K. (2020). Digitalization of Mustahiq Economic Empowerment Model based on Productive Zakah Fund. *International Conference of Zakat*, 419–428. <https://doi.org/10.37706/iconz.2020.220>

