FINTECH AND THE DETERMINANTS OF EFFICIENCY OF NON-GOVERNMENTAL ZAKAT INSTITUTIONS IN NIGERIA

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Abstract: *Zakat is compulsory on Muslims from wealth that is up to an amount to the recipients (al-Mustahiq) for socio-economic justice. Zakat is managed by government institutions in most Muslim countries. In Nigeria, however, not all zakat institutions are managed by government especially where Muslims are not dominant. Such gap is filled by non-governmental zakat institutions (NZIs) making zakat administration more efficient. The intention of this paper is to examine the efficiency of NZIs in Nigeria. The data comprises a panel of six non-governmental zakat institutions in Nigeria in the period of 2015 to 2019. The use of Data Envelopment Analysis (DEA) in this study allowed us to differentiate between the three kinds of efficiency known as technical (TE), pure technical (PTE) and scale efficiency (SE) for efficiency improvement. From Tobit Regression, more analysis was carried out to explore the influence of Fintech and determinants of the efficiency of NZIs in Nigeria. The study found out that NZIs exhibited mean technical efficiency of 74.3% and scale inefficiency dominates the pure technical inefficiency effects in determining technical efficiency of NZIs. This indicates that there is need to pay more attention on technology to enhance efficiency of NZIs.*

Keywords: Fintech, Efficiency, *Zakat*, Non-governmental *Zakat* Institutions, Nigeria.

INTRODUCTION

In measuring performance of non-profit making organization, efficiency is an important component that evaluates the utilization of resources to yield output. Whereas FinTech is a system that disrupt the usual financial transaction in a convenient, easy, and transparent way. The need for implementing technological innovations like Fintech in administration of organisations becomes imminent recently. As Fintech utilization drives the organization to achieve its objectives, suitable Fintech-based organization is expected to perform efficiently and effectively. Thus, Fintech applications are essential in efficiently achieving goals especially in financial institutions.

As Fintech is important in financial institution and other profit-making organization, so it is in non-profit making sector of economy. In *zakat* institutions for instance, Fintech implementation plays an essential role in enhancing its performance towards achieving socio-economic justice efficiently. In line with this and to the best of our knowledge, no research was conducted on efficiency and Fintech applications in non-governmental *zakat* institutions in Nigeria, thus this study intends to examine Fintech as a determinant of efficiency in non-

governmental *zakat* institutions in Nigeria. Other determinants of efficiency like governance and administration have also been analysed.

This paper discusses the empirical analysis of the determinants of efficiency of non-governmental *zakat* institutions in Nigeria. This analysis is divided into FinTech model, governance model, administrative model, and comprehensive model. Descriptive statistics come first before the empirical analysis of Tobit regression model as conclusion forms the last part of the paper.

LITERATURE REVIEW

Nigeria is a secular country with multiple religious beliefs and each state is allowed by law to practice its own systems of laws (Ibrahim & Shaharuddin, 2015). As many states implemented Shariah legal systems and established *zakat* commissions or boards like Kano and Sokoto states. However, most of these states could not effectively manage *zakat* and this makes the aim of the creation of *zakat* institutions to be virtually defeated (Muhammad, 2018). Therefore, the establishment of non-governmental *zakat* institutions helps in complementing the efforts made by the government to encourage collection, distribution and create awareness among the public (Ibrahim, 2017). Despite their importance, the efficiency of non-governmental *zakat* institutions in Nigeria is yet to be established.

Accordingly, in various Muslim communities in Nigeria it is difficult to ascertain the impact of *zakat* on poverty and for socio-economic growth because of the insignificant collection (Ashafa, 2014). This may be related to lack of support by government and other stakeholders in providing favourable background like relevant policy and transparent administrative system with convenient collection platforms to achieve efficiency in *zakat* administration (Ibrahim & Shaharuddin, 2015; Muneeza, 2017).

Amongst the pioneer studies on efficiency of *zakat* institutions are Abd Wahab & Abd Rahim, (2011), (2012) and (2013), Ahmad & Ma'in (2014) and Noor et al. (2015). Abd Wahab & Abd Rahim (2011) analysed the efficiency of *zakat* institutions in Malaysia using three different types of Data Envelopment Analysis (DEA) technique (technical efficiency - TE, pure technical efficiency - PTE and scale efficiency - SE to estimate *zakat* efficiency. The study further utilises the Tobit model to determine the efficiency of *zakat* institutions in Malaysia. Another study by the same authors examines the changes in productivity of *zakat* institutions in Malaysia from 2003 to 2007 with the data comprising 14 State Islamic Religious Councils (SIRCs) in Malaysia. Efficiency is measured using the DEA method based on the Malmquist Index (Abd Wahab & Abdul Rahman, 2012). The results indicate that *zakat* institutions show mean technical efficiency of 80.6%, while in determining technical efficiency of *zakat* institutions in Malaysia pure technical inefficiency dominates the scale inefficiency effects. Advance analysis of Spearman and Pearson correlation coefficients indicates that the uncertainty of *zakat* organization efficiency.

The study of Zakaria & Malek (2014) examines effects of Maslow's hierarchy of needs on *zakat* distribution efficiency and evaluates customer satisfaction, internal process, knowledge worker and financial management as four dimensions using Balanced Score Card. Statistical Package for Social Sciences (SPSS) and Analysis of Moment Structure (AMOS) are used in data analysis and the results show that Maslow's hierarchy of needs has positive effects on *zakat* distribution efficiency. This confirms that the distribution of *zakat* in sustainable forms may satisfy recipients and ensure an enhanced quality of life. Al-Ayubi et

al. (2018) use production approach in evaluating the efficiency of Indonesian Zakat Institutions (IZI), including TE, PTE and SE and further examine the sources of inefficiency employing the DEA technique. The result shows increasing problems of IZI Mass and IZI Non-Mass are the socialization costs, the number of volunteers, the amount of *zakat* collected, and the distribution of consumptive *zakat*, which cumulatively reduces the intermediation function of *zakat* institutions. And the IZI must resolve these issues to ameliorate the efficiency of *zakat* institutions.

This study of Saharuddin et al., (2017) analyses the level of efficiency and effectiveness of *zakat* payroll system and digital *zakat* on the acceptance of *zakat* funds in BAZNAS for the period of 2016-2017 applying DEA method which compares the distribution ratio with the collection of *zakat* funds from each program. The findings of the study indicate that both the *zakat* payroll system and digital *zakat* have a high level of efficiency and effectiveness. From this result, increasing the effectiveness and efficiency of *zakat* institutions, *amil* must be more active in creating programs available with current conditions. Similarly, Ahmad & Ma'in (2014) use the two-stage linked DEA model to find that both collection and distribution have lagging resources that are referred to as technical efficiency. The results further show lower efficiency in distribution than in collection function. Lastly, from the overall efficiency, allocative and cost efficiency scores show maximum efficiency.

Similarly, another study of *zakat* efficiency using DEA is conducted by Kurniawan (2018) aims to analyse the level of efficiency and determine the factors that affect the efficiency of the National *Zakat* Management Organization (OPZ). The study takes six OPZs and examines them from 2012-2016. The analysis technique used in the two-stage DEA. The first stage, using DEA to measure OPZ efficiency level with production approach and assumption of output-oriented CRS and VRS. The second stage, using a Tobit regression model to determine the factors that affect OPZ efficiency. The results of DEA, during the period of 2012-2016 OPZ efficiency experience a positive trend with a general increase in OPZ performance. From the results of Tobit regression, the total of human resources has a significant negative effect on the level of efficiency, transparency and OPZ type significantly positive, while the *zakat* payment system and ACR ratio do not affect the efficiency level of OPZ. The frequency of the application of DEA in measuring *zakat* efficiency by various authors shows the relevance of the technique.

The efficiency of *zakat* administration in Nigeria has also been mentioned by some scholars with different descriptions. Ibrahim & Shaharuddin (2015) identify the inefficient *zakat* administration system in Nigeria as a situation that requires serious reform. Some scholars show the importance efficiency of *zakat* institutions in Nigeria in relation to certain aspect like poverty alleviation (Kareem & Bankole, 2016). However, studies measuring the level of efficiency of *zakat* institutions in Nigeria are unavailable. This study is the first to examine efficiency in non-governmental *zakat* institutions in Nigeria.

However, the study of Maidoki (2018) on restructuring Sokoto Zakat and Endowment Commission (SOZECOM) suggest the application of technology to improve the efficiency of *zakat* administration in Nigeria. Meanwhile, Muhammad (2018), discovers that information and communication technology (ICT) is minimally applied in *zakat* administration in Nigeria, and where it is applied it is done unsystematically. However, Utami (2019) cautions that the use of technology in *zakat* administration must be done wisely to avoid deterrence of the role of human resources in the institution. This may be contrary to the aim of *zakat* for

empowerment and maintaining social value. But some scholars remain firm on the view that the remarkable significance of digital technology can help in creating social value (Maidoki, 2019). It is in line with this the study aims to analyse the efficiency of *zakat* administration in non-governmental *zakat* institutions examining Fintech and other determinants of efficiency. Fintech is discussed in the next section.

The Concept of Fintech

Financial technology (Fintech) innovation uses technology to offer financial services with potential benefits to consumers such as cost reduction, improvements in efficiency and greater transparency (Azizah & Choirin, 2018). The Global Fintech Adoption Index (2019) defines Fintech as organizations that combine innovative business models and technology to enable, enhance and disrupt financial services. To simplify their definition, Alaabed & Mirakhor (2017) refer to Fintech as the use of technological innovation in the provision of financial services. Fintech offers an opportunity for the Islamic finance industry to move to the next level of development (Islamic Fintech Report, 2018). Fintech firms must apply principles of customer protection including transparency, fair treatment, reliability, data privacy and security, as well as effective and efficient handling of customers' complaints (Batunanggar, 2019). According to Kang (2018), mobile Fintech payment service offers a more versatile and convenient payment method than traditional payment services. It allows integration of multiple bank accounts and cards information on a single FinTech payment platform with the ability to select the desired payment institution for payment of *zakat*. People appreciate the convenience and transparency of paying *zakat* via online payment system (Indrani & Sagara, 2015). This instils trust and reliability in the minds of both *zakat* payers and recipients that leads to having a good impression about the *zakat* institutions (Zainal et al., 2016). Therefore, *zakat* institutions should focus on the application of Fintech for efficient *zakat* administration and achieve the objectives (Wulan et al., 2018).

METHODOLOGY

According to Sengupta (2003), developments in new efficiency theory based on the non-parametric DEA approach have followed important phases, which includes use of the engineering concept of efficiency as a ratio of weighted outputs to weighted inputs. This is the concept of technical or production efficiency where the prices are not used at all. Hence this measure of efficiency was widely applied in public sector organizations like *zakat* institutions, where output prices are either unavailable or determined outside the private markets.

The efficiency is defined as a ratio of the weighted sum of outputs to the weighted sum of inputs. Data Envelopment Analysis (DEA) has been extensively used to compare the efficiencies of non-profit and profit organizations such as schools, hospitals, shops, bank branches and other environments in which there are relatively homogeneous DMUs. In line with the studies of Kurniawan (2018), Al-Ayubi et al. (2018), Ascarya (2017), and (Abd Wahab, 2013), this study will use production approach in measuring the efficiency of non-governmental *zakat* institutions in Nigeria. Following Camanho & Dyson (1999) and Abd Wahab (2013), this study used expenditure as input; *zakat* recipients and *zakat* collection will be used as outputs to measure the level of efficiency of non-governmental *zakat* institutions in Nigeria.

The data analysis was conducted in two different segments. Firstly, data was analysed using DEA technique to measure the efficiency of non-governmental *zakat* institutions in Nigeria. Secondly, was to determine the factors affecting the efficiency of non-governmental *zakat* institutions in Nigeria by utilising Tobit Analysis. Tobit model will be used to determine the factors that influence the level of efficiency of the non-governmental *zakat* institutions in Nigeria. After obtaining the efficiency value in the first stage using the DEA technique explained earlier, the value will be analysed with several independent variables to determine the effect of these variables on the second stage.

Tobit Regression
The reason for using the Tobit method in this study is because the data used in this study is sensitive data, i.e., the value of the non-independent variable, namely the level of technical efficiency (TE) is limited and can only range between 0 to 100. The Tobit Regression Model is as follows:

$$TE_{it} = \beta_0 + \beta_1\,FMA_i + \beta_2\,FMW_i + \beta_3\,MBS_i + \beta_4\,WPA_i + \beta_5\,BS_i + \beta_6\,MPY_i + \beta_6\,AC_i + \beta_6\,NOB_i + \beta_7\,NOS_i + \varepsilon_i$$

$$PTE_{it} = \beta_0 + \beta_1\,FMA_i + \beta_2\,FMW_i + \beta_3\,MBS_i + \beta_4\,WPA_i + \beta_5\,BS_i + \beta_6\,MPY_i + \beta_6\,AC_i + \beta_6\,NOB_i + \beta_7\,NOS_i + \varepsilon_i$$

$$SE_{it} = \beta_0 + \beta_1\,FMA_i + \beta_2\,FMW_i + \beta_3\,MBS_i + \beta_4\,WPA_i + \beta_5\,MBT_i + \beta_6\,MPY_i + \beta_6\,AC_i + \beta_6\,NOB_i + \beta_7\,NOS_i + \varepsilon_i$$

Explanations:
TE:	Data Envelopment Analysis (DEA) scores: Technical Efficiency, Pure Technical Efficiency, Scale Efficiency
FMA:	FinTech Mobile App
FMW:	FinTech Mobile Wallet
MBS:	Mobile Banking System
WPA:	Web Payment Access
MBT:	Members of Board Trustees
MPY:	Meeting per Year
AC:	Audit Committee
NOB:	Number of Branches
NOS:	Number of Staff

Since the panel data will be used, it is possible to control the observed and unobservable determinants of efficiency in the study, which will be investigated using the Tobit model. Panel data in this study contain observations of multiple phenomena like amount of *zakat* collected and distributed over multiple time periods of five years for the NZIs in Nigeria.

Data and Inputs-Outputs Description
This study chooses production approach to describe the inputs and outputs. In the production approach, non-governmental zakat institutions are considered to produce more zakat funds in

terms of collection and distribution. The choice of inputs and outputs is based on availability of data since this study is assumed to be unprecedented in Nigeria. The descriptive statistics of the inputs and outputs used in the analysis of efficiency of NZIs in Nigeria during the study period is described in Table 1. The analysis is conducted using data collected from the NZIs in Nigeria through their personnel as most of the data were not obtainable in the annual reports.

Table 1. Descriptive Statistics of Inputs and Outputs of the NZIs (2015-2019)

Item	Mean	Median	Maximum	Minimum	Std. Dev.
Input					
Expenditure	50,854,583.96	20,339,548.50	291,458,935	876,991	71,066,180.93
Output					
Recipients	1,200	224	8,820	33	1,952
Collection	53,595,943.05	36,703,356.00	361,390,312.00	876,991.00	82,119,197.00

Table 1 presents the descriptive statistics of outputs and inputs of 6 non-governmental *zakat* institutions in Nigeria during the study period. It shows extensive span between minimum and maximum sum of inputs implied and outputs produced by the non-governmental zakat institutions in Nigeria. This is because of disparity in sizes of the *zakat* institutions and the respective locations where they operate. For instance, Zakat and Sadaqat Foundation (ZSF) and Jaiz Charity and Development Foundation (JCDF) operate in Lagos and Abuja, respectively. Amongst the NZIs, ZSF has the highest figure as it is in Lagos, large commercial city, and former Federal Capital with high population of Muslims. Likewise, JCDF is in Abuja the current capital city of Nigeria with many government establishments and large number of Muslims. On the hand, MUZASAF has lowest input and outputs values despite being in Lagos too. This could be due to the size of the institution.

RESULTS
Multi-stage DEA Efficiency Measure: Frontier Construction and Efficiency

One of the benefits of the Multi-stage DEA is that it identifies efficient projected points having input and output mixes with similarities to inefficient points and it is also invariant to units of measurement. The study presents the efficiency of the 6 NZIs starting from the year 2015 to 2019. As shown in the Table 2 and 3, the presentation is under the constant return to scale (CRS) and variable return to scale (VRS) respectively. The value of unity indicates that the institution is on the frontier in the respective year. While the value of less than unity indicates that the institution is below the frontier or technically inefficient. Therefore, the lower the values from unity, the more inefficient the institution in contrast with the values closer to unity.

Table 2. Efficiency of the Non-governmental Zakat Institutions (2015-2019) – VRS

NZIs	2015	2016	2017	2018	2019
Jaiz Charity & Development Foundation (JCDF)	0.043	1.000	1.000	1.000	1.000
Zakat & Sadakat Foundation (ZSF)	1.000	1.000	1.000	1.000	1.000
The Companion Zakat Fund (CZF)	1.000	0.981	0.916	0.917	1.000
Al-Hayat Relief Foundation (AHRF)	0.370	0.806	0.924	1.000	0.600

NASFAT Agency for Zakat & Sadaqat (NAZAS)	0.034	1.000	1.000	1.000	1.000
Muslim Zakat & Sadaqat Foundation (MUZASAF)	1.000	1.000	1.000	1.000	1.000
Mean	0.575	0.964	0.973	0.986	0.933

When CRS model assumes that DMUs are operating at the optimal level. The model of CSR indicates that at the time all DMUs are operating at the optimal level, the TE is stunned with the SE. Thus, the VRS model is used to calculate the PTE.

Table 3. Efficiency of the Non-governmental Zakat Institutions (2015-2019) - CRS

NZIs	2015	2016	2017	2018	2019
Jaiz Charity & Development Foundation	0.011	1.000	0.624	0.821	0.468
Zakat & Sadakat Foundation	0.026	0.911	0.889	0.568	0.425
The Companion Zakat Fund	0.056	0.972	0.912	0.790	1.000
Al-Hayat Relief Foundation	0.025	0.801	0.912	0.655	0.267
NASFAT Agency for Zakat & Sadaqat	0.030	0.986	1.000	1.000	0.480
Muslim Zakat & Sadaqat Foundation	1.000	1.000	1.000	1.000	1.000
Mean	0.191	0.945	0.889	0.806	0.607

Table 2 and 3 present the percentage of the output level obtained in comparison to the maximum potential output level at the specified input mix. For example, JCDF produced 14.3% of its potential output level in 2015 and CZF produced 37% of its potential output under VRS version. In the same year under CRS version, MUZASAF produced maximum potential output of 100%. As shown in Table 5.2 and Table 5.3, the weighted geometric mean indicates that the average efficiency for the whole industry increases for the period 2016 to 2017 but indicates a decrease in 2018 to 2019. Most of the efficient DMUs under both VRS and CRS utilise technology in zakat administration. They also have website payment access in their *zakat* payment system where *zakat* can be paid from the website of the institution. Generally, the efficiency of non-governmental *zakat* institutions in Nigeria is relatively high based on VRS and CRS. This is related to technical aspect rather than scale or size, which remain identical across all the institutions.

Determinants of Zakat Efficiency
In measuring performance of non-profit making organization, efficiency is an important component that evaluates the utilization of resources to yield output. Whereas FinTech is a system that disrupt the usual financial transaction to a convenient and easy one in a transparent way. The need for implementing technological innovations like FinTech in administration of organisations becomes imminent recently. Suitable FinTech-driven organization is expected to perform efficiently and effectively as FinTech utilization drives the organization to achieve its objectives. Thus, FinTech applications are essential in achieving goals especially in financial institutions. As FinTech is important in financial institution and other profit-making organization, so it is in non-profit making sector of economy. In *zakat* institutions for instance, FinTech implementation plays an essential role in enhancing its performance towards achievement of socio-economic justice efficiently. In line with this and to the best of our

knowledge, no research was conducted on implementation of FinTech applications in *zakat* institutions in Nigeria, thus this study intends to fill this gap.

Empirical Results: FinTech Model
From the results of random effects Tobit regression model, this section presents the relationship between FinTech applications factors known as FinTech mobile application (FMA), FinTech mobile wallet (FMW), mobile banking system (MBS), web Fintech application (FWA) and TE, PTE, and SE of NZIs in Nigeria. It is worthwhile to observe that the DEA efficiency scores are the dependent variables. When estimated coefficient is positive it shows increase in efficiency, while a decline in efficiency is represented by a negative coefficient. The estimation results are presented in table 4.

Table 4. Tobit Regression Results of FinTech Applications Model

Dependent Variable	TE		PTE		SE	
	Coefficient	P>[t]	Coefficient	P>[t]	Coefficient	P>[t]
Constant	0.230	0.831	0.446	0.001***	0.229	0.032*
FMA	-0.645	0.532	0.757	0.538	-2.047	0.054*
FMW	1.675	0.088*	0.946	0.407	1.350	0.160
MBS	4.507	0.000***	0.409	0.753	4.439	0.000***
WPA	4.293	0.001***	3.767	0.006***	3.937	0.001***
Sigma	0.200		0.238		0.198	

FMA: FinTech Mobile Application; FMW: FinTech Mobile Wallet; OPS: Online Payment System; MBS: Mobile banking system; WPA: Website payment access
***, ** and * significant at 1 percent, 5 percent, and 10 percent respectively

Table 4 presents the relationship between TE, PTE, and SE results and FMA, FMW, MBS, and WPA. Under TE, the relationship between TE and FMW, MBS, and WPA is positive except FMA. Likewise, all the coefficients are statistically significant except for FMA. Going by this outcome, as FMA is found to be negatively associated with TE score simply means that the as FMA is being used so the institution is technically inefficient. As the result is not statistically significant at any conventional level, so the variable FMA found to have negative relationship with TE of NZIs in Nigeria. This indicates that use of mobile application may not increase the efficiency of zakat institution involved.

On the other hand, FMW is found to be related with TE score. In line with the hypothesis, the results show that as utilising mobile *wallet* for *zakat* payment by *zakat* institution enhances the efficiency of the organization. Thus, existence of Fintech mobile wallet in *zakat* institution increases the efficiency *zakat* institutions in Nigeria. Similarly, MBS is found to have positive relationship with TE. This shows that the of mobile banking in *zakat* payment by *zakat* institutions in Nigeria influences the TE of the organization. This may be because MBS is widely accepted in Nigeria with its simplicity and ease of use. Its also noted that MBS is found to be statistically significant. Another important variable with positive influence on TE of *zakat* institution is WPA. Payment of *zakat* directly from the website of the *zakat* institution through Fintech applications. Thus, the existence of WPA conversely influences the efficiency of *zakat* institutions in Nigeria.

Regarding PTE class, the relationship between PTE and FMA, FMW, MBS, and WPA are all positive. Though only one variable, WPA, is found to be statistically significant at 10

percent. As in the earlier results in TE category, the variable FMA is found to be positively related with PTE score. Likewise, FMW is also found to be positively associated with PTE score. The variable MBS is found positively influencing on PTE. As in all other Fintech variables, WPA is equally positive in relation to PTE. Additionally, WPA is found to be statistically significant at 1 percent on PTE of the organization. In essence, the higher the use of Fintech applications the more efficient the organization. This simply means that NZIs in Nigeria can improve their efficiency by utilising Fintech applications like FMA, FMW, MBS, and WPA.

The last column of the table 6.2 presents the estimation of Fintech factors with scores under independent variable SE. Contrary to the results in the previous models, variable FMA is found to be statistically significant to and negatively associated with SE score. This suggests that use of mobile application in *zakat* payment does not lead to SE of *zakat* institutions in Nigeria. However, variable FMW is found to be positively associated with SE score. this implies that use of mobile wallet for *zakat* payment increases the SE of NZIs in Nigeria.

In the same vein, the variable MBS is positively associated with SE score, and statistically significant at 1 percent confidence level. This implies that the use of mobile banking by *zakat* institutions enhances the level of SE of the organization. Similar to these results appear in WPA where the variable is found to have positive relationship with SE and also statistically significant at 1 percent confidence level. As postulated in the hypothesis, the result indicates that utilising WPA by NZI in Nigeria increases the scale efficiency of the organization.

Comprehensive Model

In this section, the determinants of efficiency of non-governmental *zakat* institutions comprising Fintech, governance and administrative factors are examined alongside the TE, PTE, and SE of NZIs in Nigeria. Table 5 shows the estimation results of the random effects Tobit regression.

Table 5. Determinants of TE, PTE, and SE

Dependent Variable	TE		PTE		SE	
	Coefficient	P>[t]	Coefficient	P>[t]	Coefficient	P>[t]
Constant	-0.273	0.215	0.494	0.055*	-0.067	0.755
MBT	-0.001	0.964	0.009	0.676	-0.019	0.329
MPY	0.003	0.717	0.008	0.384	-0.006	0.394
AC	0.153	0.442	-0.261	0.244	0.453	0.027
NOB	-0.021	0.213	-0.041	0.023*	0.011	0.428
NOS	0.225	0.196	0.041	0.026*	-0.011	0.472
FMA	-0.288	0.791	1.252	0.331	-2.145	0.055*
FMW	2.127	0.072*	0.424	0.749	2.458	0.036**
MBS	4.281	0.001***	0.758	0.533	3.754	0.001***
FWA	4.199	0.002***	2.287	0.105	4.846	0.000***
Sigma	0.181		0.220		0.177	

MBT: Members of Board of Trustees; MPY: Meeting per Year; AC: Audit Committee; NOB: Number of branches; NOS: Number of staff; FMA: FinTech Mobile Application; FMW: FinTech Mobile Wallet; MBS: Mobile banking system; WPA: Website payment access

***, ** and * significant at 1 percent, 5 percent, and 10 percent respectively

Table 5 presents the determinants of efficiency under TE, PTE, and SE of non-governmental *zakat* institutions in Nigeria. All variables have positive relationship with TE apart from MBT, NOB, and FMA. Whereas variables like FMW, MBS, and WPA have significant effect on TE of NZIs. In respect of the PTE class, all variables affect the PTE of NZIs positively except AC and NOB, whereas only NOB and NOS are significant in determining the PTE of NZIs. Contrarily, all variables are found to have positive relationship with SE with exception of MBT, MPY, NOS, and FMA. Variables like FMA, FMW, MBS, and WPA have significance in determining the SE of NZIs in Nigeria.

Discussion of Results

The study assessed nine determinants of the efficiency of non-governmental *zakat* institutions in Nigeria. The determinants consist of Fintech mobile application, dummy of mobile wallet, mobile banking system, dummy of web payment access, size of board of trustees, number of meetings per year, dummy of existence of audit committee, number of branches, and number of staff. In the following section, the determinants of *zakat* efficiency are discussed with regards to the results in table 6.5.

Mobile application has significant features including making convenient payments. Mobile applications have additional multi-level security feature for reliability of transactions. This is an addition to its user-friendliness that encourages users in making payment to the organization. Having mobile application in a *zakat* institution may increase its collection. Total collection of *zakat* is one of the outputs that signifies efficiency.

From the results of Tobit regression model, the variable FMA is found to have negative relationship with the efficiency of non-governmental *zakat* institutions in Nigeria. However, the results are significant indicating that mobile application is a convenient mode of payment which improves the way *zakat* is collected. A robust mobile application among *zakat* various modes of payment is important in *zakat* collection towards improving efficiency. With regards to non-governmental *zakat* institutions in Nigeria, one of the important roles played by mobile application is eliminating the need for cash transactions which may entice infidelity and unaccountability. It may also reduce the necessity of making physical cash lodgement which is stressful and inconvenient.

CONCLUSION

The study investigates the efficiency of non-governmental zakat institutions in Nigeria during the period of 2015-2019. The results show that non-governmental zakat institutions paraded mean technical efficiency of 74.3%. It also indicated that scale inefficiency dominates the pure technical inefficiency effects in determining technical efficiency of non-governmental *zakat* institutions in Nigeria. This indicates that there is need to pay more attention on technology to enhance efficiency. In respect of the determinants of efficiency in non-governmental *zakat* institutions, FinTech applications like FMA, FMW, MBS, and FWA are most significant and to TE, PTE, and SE efficiency scores. However, both factors under governance and administration also have a role to play in determining efficiency of non-governmental *zakat* institutions in Nigeria.

Originally, this study attempts to examine the efficiency of non-governmental zakat institutions in Nigeria. Moreover, the study has made huge disposition in support of policy and guidelines for the pertinent establishments such as *zakat* institutions and the government

to enhance *zakat* administration in the country. The Central Bank of Nigeria could also take note of the relevance of Fintech as an efficient payment system that can increase the efficiency of non-governmental *zakat* institutions in Nigeria.

Though the scope of this study will be wider if period is widened, and government-owned zakat institutions are included. Also, part of the limitations is the scarcity of data related to inputs, outputs, and other variables like number of *zakat* payers being important output that should have been included. Likewise, the analysis on the contribution of audit committee would be deeper if professionals amongst them were identified. Notwithstanding these limitations, the study may contribute with its findings to the obtainable body of knowledge related to Fintech and efficiency of non-governmental *zakat* institutions in Nigeria. It as well provides more awareness for the regulators towards improving the administration of *zakat* institutions and in forming guidelines for Fintech utilisation in financial institutions like *zakat* institutions. Other Muslim countries may also utilise the findings of this study by tailoring them to fit their system in enhancing the efficiency of their *zakat* institutions.

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