

The Impact of Distributed Zakat on Sustainable Economic Development in Indonesia: A VECM Approach

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Abstract:

This paper aims to look at the effect of distributed zakat on sustainable economic development variables in Indonesia. Particularly economic growth, human development index (HDI), and poverty rate. A vector error correction model (VECM) was used with time series data from 2001–2020. Furthermore, Unit root test and co-integration test have been also applied for testing the stationarity and long run relationship respectively. It was assumed in the study that there is an affirmative impact of distributed zakat on sustainable economic development in short and long run. Consequently, the primary objectives of zakat distribution related to sustainable zakat funds and economic growth will be successfully achieved. One of the limitations of this research is the case study of one country, Indonesia, so it is suggested to include more countries in further studies in order to generalize the results. Indonesian government should implement tax reduction policies for zakat institutions to assist them in optimizing collection and distribution schemes. In addition, zakat institutions are also recommended to expand their distribution to reach people that are more vulnerable so that it could have a crucial impact on poverty alleviation and enhance sustainable development. There is no sufficient empirical results related to zakat and SDGs. However, the present paper is original and assessed the dynamic short-run and long run effect of distributed zakat on the Human

Development Index (HDI), poverty rate and economic growth in Indonesia.

Keywords: *economic growth; vector error correction model (VECM); sustainable economic development; zakat*

Abstrak:

Tulisan ini bertujuan untuk melihat pengaruh zakat yang didistribusikan terhadap variabel pembangunan ekonomi berkelanjutan di Indonesia. Khususnya pertumbuhan ekonomi, indeks pembangunan manusia (HDI), dan angka kemiskinan. Model koreksi kesalahan vektor (VECM) digunakan dengan data deret waktu dari tahun 2001–2020. Selain itu, uji akar unit dan uji kointegrasi juga telah diterapkan untuk menguji stasioneritas dan hubungan jangka panjang. Dalam penelitian ini diasumsikan bahwa terdapat dampak afirmatif dari distribusi zakat terhadap pembangunan ekonomi berkelanjutan dalam jangka pendek dan jangka panjang. Dengan demikian, tujuan utama penyaluran zakat terkait dana zakat berkelanjutan dan pertumbuhan ekonomi akan berhasil tercapai. Salah satu keterbatasan penelitian ini adalah studi kasus di satu negara, yaitu Indonesia, sehingga disarankan untuk melibatkan lebih banyak negara dalam penelitian lebih lanjut agar dapat menggeneralisasi hasil. Pemerintah Indonesia harus menerapkan kebijakan pengurangan pajak bagi lembaga zakat untuk membantu mereka mengoptimalkan skema pengumpulan dan distribusi. Selain itu, lembaga zakat juga disarankan untuk memperluas distribusinya hingga menjangkau masyarakat yang lebih rentan sehingga dapat memberikan dampak penting terhadap pengentasan kemiskinan dan meningkatkan pembangunan berkelanjutan. Belum ada hasil empiris yang memadai terkait zakat dan SDGs. Namun, makalah ini orisinal dan menilai dampak dinamis jangka pendek dan jangka panjang dari distribusi zakat terhadap Indeks Pembangunan Manusia (HDI), tingkat kemiskinan dan pertumbuhan ekonomi di Indonesia.

Kata Kunci: *pertumbuhan ekonomi; model koreksi kesalahan vektor (VECM); pembangunan ekonomi berkelanjutan; zakat*

Introduction

Zakat is a compulsory tax that is taken from privileged Muslims and given to the needy and less privileged. This is as per the ruling of zakat that is mentioned in the Holy Quran. It is also one of the five pillars of Islam. It is considered an obligation for those who have welfare that falls under the Nisab value. Individuals typically

work hard and are very dedicated to achieving wealth (Ahmed Shaikh & Ghafar Ismail, 2017). Therefore, it shows our steadfast confidence in Allah when we offer or share even a small bit of this. It helps us to understand what Allah's Grace bestows upon us and what we actually spend. Those who cheerfully give to Allah's cause are in his favor.

The amount to be given out as zakat is only 2.5% of the wealth that falls into the categories of assets that can be levied. Giving alms to the needy is a form of purification for an individual. Zakat is not only a form of worship, but also an important principle in Islamic economics (Khasandy & Badrudin, 2019). Therefore, when a person pays Zakat, he is not only fulfilling his right to Allah but also fulfilling society rights by contributing to uplifting society. According to Sakti (2007), zakat has two main functions in society: it connects humans vertically to Allah and it gives collective benefit to the people in the environment where zakat is running. Zakat is considered crucial within the Islamic economic framework for poverty alleviation and economic welfare. It helps to establish justice and circulate monetary resources from excess to deficit.

The Sustainable Development Goals (SDGs) aim to address some of today's most pressing issues, such as poverty and inequality (UNDP, 2018). Different religions contribute significantly to the funding of those goals. In Islam, it is done by giving out zakat. Zakat is one of the world's major means of wealth transfer to the needy, as it is a mandatory contribution for all Muslims earning above a set threshold. When applied well, zakat can address the objectives of the Sustainable Development Goals (SDGs), especially poverty alleviation, equality, and human development (Pickup, 2017). Previous literature on zakat and Sustainable development suggested the positive role of zakat in achieving Sustainable Development Goals in both developed and developing countries. For instance, the studies of Dembele & Bulut (2021) in Turkey, Akmal et al., (2020), Yusoff (2011) in Malaysia, Suprayitno (2020) and (Ayuniyyah et al., 2022) in

Indonesia argued that zakat distribution programs have helped to alleviate poverty and also to decrease income inequality. Furthermore, zakat distribution programs focus on at least five crucial areas, including the education sector, the health sector, the social sector, the economic sector, and the Da'wah sector. (Islamic religious propagation). An increase in the amount of zakat money contributed to these channels will ultimately lead to a better standard of living in a country, the reduction of poverty and inequality, and an improvement in the Sustainable Development Goals (Nurhapsari et al., 2021).

Nowadays, poverty alleviation is one of the major problems faced by Muslim societies. Although Islam has a clear set of principles to promote justice and welfare in the economy, unbalances regarding poverty and income equality are still challenging Muslim societies. In Indonesia, research conducted on Zakat and sustainable development are mostly theoretical research (Ibrahim, 2015; Muliadi, 2020) and focused on one dimension of sustainable development goals such as economic growth (Suprayitno (2020)), poverty alleviation (Pickup (2017)) and (Ayuniyyah et al., 2018)). Therefore, this study is relevant in case that it tries to look at the role of distributed zakat on sustainable economic development in three different dimension namely Human development, economic growth and poverty which represent the most important dimension of SDGs. For that purpose, this research tries to analyze empirically the significant effect of distributed zakat on sustainable development in the world's largest Muslim country, Indonesia. Specifically, we aim to look at the short run and long run impact of distributed zakat on economic growth, poverty rate, and human development Index. This research can help zakat institutions manager to draw a new distribution based on the empirical evidence. It can also provide recommendation for government for sake of policy design related to zakat and sustainable development.

The following is a breakdown of the paper's structure: The

study's background and literature review will be presented in the second section. In section three, we will talk about the methods; in section four, we will display the results and discussion. Section five will present the conclusion and recommendations.

Literature Review

Framework of zakat and SDGs

Zakat is currently considered as a method for reducing poverty, which is one of the biggest problems with modern civilization. Poverty has always been pervasive in the world and a barrier to advancement. The Quran examines poverty in detail and suggests a number of ways to lessen its pain and anguish in society. Charity can help alleviate the envy and other negative emotions of the poor and instead foster a sense of community and harmony among the beneficiaries (Kasri, 2016; ZULKIFLI et al., 2021). Therefore, Islamic Relief using zakat assists some of the world's poorest and most needy communities. These people are happy and have hope that one day they may be able to give zakat rather than receive it thanks to the generosity of Zakat suppliers. As it is said, the giving hand is better than the one receiving (Ahmed Shaikh & Ghafar Ismail, 2017).

Economic welfare has long been spoken about since the beginning of time. One of the ways to improve the economy is by reducing poverty levels in not only the nation or society as a whole but also at an individual level. Poverty can be a major deterrent to production. Individuals will look for money just to get something to eat or have a roof over their head. In addition, the time spent in doing this could have been used for other productive economic activities (Cingano, 2014; World Bank, 2022). It can also lead to vice and immorality especially in the women folk and the youth. Not only is it a cause of drug dealing but also health issues such as depression. Although depression can affect everyone, regardless of socioeconomic level, poverty exacerbates the condition and makes it more difficult for a person to get the proper medical care. However, if the aspects of

poverty that fuel sadness are lessened, then fewer people should experience depression (Ismal, 2014).

In the SDGs, the UN has placed poverty alleviation as the number one priority. This shows how critical the issue of poverty is worldwide. In many societies, the responsibility has been left to large corporations apart from the government to help contribute to the society's welfare. Corporate social responsibility has indeed helped in contributing to uplift the community but this is only done occasionally and is not regulated by the law, as it is not mandatory (UNDP, 2018; Fallah Shayan et al., 2022). On the other hand, Islam has placed this responsibility at individual level. Every individual looks out for the other in whatever way they can. Indonesia being the fourth highest in terms of population is also a Muslim majority nation. This means it has a larger possibility of the number of individuals who give out zakat if they reach the Nisāb value.

In addition, the building of micro hydropower plants, which supply electricity to over 4,500 people in four remote Indonesian settlements, was the first important cooperation endeavor between BAZNAS and the UNDP. This renewable energy project is part of a larger initiative financed by the Global Environment Facility. Upcoming projects utilizing Zakat funds include sustaining the livelihoods of communities with newly gained energy access and preserving biodiversity (UNDP, 2018). By such projects, it is possible to see how zakat can support productive capacity of communities and individuals, as opposed to only consumptive or humanitarian attempts such as paying for medical expenditures and disaster assistance. This indicates that the distribution of zakat has a positive effect on economic growth and social wellbeing.

Zakat and sustainable economic development

Many scholars have conducted the study between zakat and sustainable economic development in Muslim societies. Whereas, most of them are theoretical investigation, few among them are empirical work. In the following section, we will review theoretical

study after digging into empirical one.

Ismail & Shaikh, (2017) explored the potential of zakat institution to achieve sustainable development goals (SDGs). After reviewing theoretical studies, they found that zakat plays a significant role in achieving sustainable development goals related to poverty, hunger, well-being and economic growth. This means that zakat institutions would help the circulation of wealth in the productive sector, which can help enterprises to grow and create more wealth in society. Hence, this direction of wealth in a productive sector will participate in achieving sustainable development goals. Similarly, Dembele & Bulut (2021) investigated the role of Islamic social finance namely zakat, Infaq, and Waqf in achieving objectives of SDGs. The findings suggested that zakat institutions showed an effective contribution in achieving at least seven sustainable development goals on the global agenda. That is to say, zakat institutions introduce distribution programs, which address at least five important sectors: education sector, health, social, economic and Da'awah (Islamic religious propagation). The rise in the contribution of zakat funds to these channels will improve the economic welfare of a country, alleviate poverty, reduce inequality and finally enhance SDGs (Nurhapsari et al., 2021).

Moreover, Pickup (2017) conducted a study related to the role of zakat institutions in financing sustainability and achieving sustainable development goals (SGDs). They argued that zakat is one of the five pillars of Islam and it is a considerable tool to pursue SGDs. They further explain that implementing the Islamic principle of zakat correctly, will help promote economic welfare and tackle the challenges of sustainable development. Also, zakat institutions can be considered as a poverty alleviation tool and a potential strategy supporting sustainable development goals (SGDs). In this view, Olanipekun et al. (2015) investigated a reviewed research about the role of zakat as a poverty alleviation tool and a strategy for sustainable development in light of the Quran and hadith. After

analyzing several verses and hadiths related to zakat, they revealed that, zakat is a significant tool for poverty alleviation and the best strategy for sustainable development. This is worth noting as zakat is distributed to eight categories of people that represent the most vulnerable in society. This will serve as a potential in promoting the development of the eight categories of people mentioned in the Quran. Consequently, helping those people will reach development all over the country and the entire society. Likewise, Ibrahim, (2015) argued that zakat has principle aims of distribution stated in the Holy Quran and Sunnah, that after being achieved, could enhance social welfare and sustainable development. In addition, according to a study by Muliadi (2020) it was found that zakat distribution towards economic empowerment community in Yogyakarta does indeed help in reducing inequality and poverty reduction. The study also recommended that the Rumah Zakat program could be employed the same way in other regions of Indonesia including urban areas. The descriptive approach and qualitative analysis were employed in this investigation. Secondary data was gathered from texts and documents pertaining to the research topic as the data source.

Suprayitno et al. (2017) examined empirically the impact of zakat on the human development program of five states in Malaysia during 1980-2009. Using Auto Regressive Distributed Lag (ARDL) with bound testing approach, it was found out that zakat has an affirmative and significant effect on human development in the five states of Malaysia in both the short and long run. This illustrates that; in the short run, the distributed zakat could stimulate a better social life of the recipients. Thus, the increase of zakat in the short run is able to increase the quality of education and social welfare. In the long run, increasing distributed zakat will influence consumption, investment, employment and also motivate zakat beneficiaries to become zakat suppliers. Consequently, the primary objectives of zakat distribution related to sustainable zakat funds and economic growth will be successfully achieved. Similarly, Akmal et al. (2020)

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concluded that the Human Development Index is affected by zakat in a positive way. In order to attain the SDGs in Indonesia, the study sought to statistically evaluate and examine the role that zakat plays in human development. The study specifically aimed to assess the variations in the Human Development Index (HDI) of zakat recipients before and after receiving zakat as well as the impact of zakat on the HDI and its constituent parts. The study only calculated the HDI's value at the individual and household levels. Using a combination of purposive and proportionate stratified random samplings, 100 zakat receivers from the three zakat distribution programs run by the zakat institution of Aceh Province, Indonesia (Baitul Mal Aceh-BMA) were chosen as the study's sample. One family per undergraduate scholarship program, zakat for cancer and thalassemia patients, and zakat for purchasing working capital for low-income households were among the zakat projects. The multiple linear regression model was used to calculate the impact of zakat on the HDI and its components, while the paired t-test was used to compare the HDI of zakat recipients before and after receiving zakat. The study discovered that zakat recipients' HDI was higher than it was before receiving zakat.

Yusoff (2011) analyzed the evidence of zakat expenditure on real out in Malaysia. Using panel data from 2003-2006, the results revealed that zakat expenditure explained significantly the variation of real out. Meanwhile, the government should improve the zakat distribution process in order to generate higher economic welfare and sustainable development. This suggests that zakat expenditure could improve the consumption of its recipients and enhance production and labor force. Therefore, zakat can be used as a fiscal policy tool to improve aggregate consumption and production and also reach the sustainability of society.

Recently, Suprayitno (2020) studied the impact of zakat on macroeconomic variables specifically economic growth in Indonesia. He used Error Correction Model (ECM) to estimate the long run

relationship between zakat and economic growth. He found out that the distribution of zakat is positively significant on the variation of economic growth. This calls attention to the fact that zakat impacts directly the real economic sector by providing resources for consumption and production purposes in the society. Thus, improvement in consumption and production will increase economic growth. All strategies used by the government, non-governmental organizations, or well-off people to lessen or end poverty in a community are referred to as poverty alleviation. The best strategy for reducing or eliminating poverty is to use it as an opportunity to improve people's skills or freedoms (Oviasuyi, 2020)

Ayuniyyah et.al. (2018), argued that zakat distribution programs in Indonesia have helped to alleviate poverty and also to decrease income inequality. The study was conducted to examine how Indonesian zakat distribution programs have helped groups in both urban and rural regions combat poverty and reduce income disparity. It included a case study of 1,309 zakat recipients overseen by Indonesia's National Zakat Board (BAZNAS), the country's coordinating zakat agency. The study was conducted in the West Java Province, namely in the cities and regencies of Bogor, Depok, and Sukabumi. The Centre of Islamic Business and Economic Studies (CIBEST) model, the deciles method, and the Gini coefficient were the analytical methods employed in the study. According to the study, the current zakat distribution programs may, as a whole, help the observed zakat beneficiaries who were experiencing poverty and economic inequality.

Finally, in the line of these literature, we understand that both theoretical and empirical investigation regarding the impact of zakat on sustainable development variables showed a positive and significant impact of distributed zakat on the Human Development Index (HDI), poverty alleviation, economic growth, and welfare economics. However, the empirical investigations looked into the relationship with separate variables without including sufficient

variables of sustainable development. The present study tries to fill this gap by examining the dynamic short-run and long-run effect of distributed zakat on the Human Development Index (HDI), poverty rate and economic growth in Indonesia. Thus, this combination of three variables will come out with generalized results regarding the impact of zakat on sustainable economic development.

Methods

Data and Definition of the Variables

Data are collected through the organization of Islamic cooperation (OIC) statistics database, United Nations Development Program (UNDP) and reports of Indonesia's National Zakat Board (BAZNAS). The study uses times series data from 2001-2020. Four variables are used: distributed zakat, which is a proxy of zakat, the Human Development Index, GDP and poverty rate, which are proxies of sustainable economic development.

Distributed zakat is the dependent variable; it represents the amount of collected zakat and distributed to the needy people enumerated by the holy Qur'an. Pickup (2017) conducted a study related to the role of zakat institutions in financing sustainability and achieving sustainable development goals (SDGs). They argued that zakat is one of the five pillars of Islam and it is a considerable tool to pursue SDGs. It explains that implementing the Islamic principle of zakat correctly, will help the promotion of welfare economic and tackle the challenges of sustainable development. Concurrently, we used distributed zakat in order to assess the impact of zakat on sustainable economic development in Indonesia.

Gross Domestic Product (GDP), Human Development Index (HDI), and Poverty rate (POR) are the independent variables used as proxies of sustainable economic development. The production of goods and services adds value to a nation's economy over time, which is known as the Gross Domestic Product (GDP). This variable is a typical indicator in this research. According to Yusoff (2011),

zakat expenditure explained significantly the variation of real out in Malaysia. For this purpose, we used GDP as a representation of the economic growth sector in order to assess the impact of distributed zakat on economic growth.

The Human Development Index (HDI) assesses how well people generally perform in key areas of human development, including enjoying a long and healthy life, knowledge, and a respectable standard of living. Suprayitno et al. (2017) argued that Zakat has a positive effect on human development in Malaysia. Hence, we chose this variable in order to examine the effect of distributed zakat on the human development index in Indonesia.

According to the World Bank (2022), the poverty rate (POR), which is computed as half of the median household income for the entire population, is the percentage of people (in a certain age group) whose revenue is below the poverty line. Ayuniyyah et al. (2018) correctly argued that zakat distribution programs in Indonesia have helped to alleviate poverty and to decrease income inequality. As a result, it is important to use the poverty rate as a representation of the poverty alleviation sector in order to examine the real impact of zakat on sustainable economic development in Indonesia.

Econometric Model and Estimation Techniques.

To analyze the relationship between these variables, the Error Correction Model (VECM) will be used. The estimation process will begin with the unit root test to test the stationarity of the series in order to avoid spurious regression and co-integration test to look at whether these series are co-integrated or not. Subsequently, we will proceed with the estimation of the Error Correction Model (VECM) in order to find the short and long-run effect of Distributed zakat on the Human Development Index (HDI), Gross Domestic Product (GDP) and poverty rate (POR).

According to Engle & Granger, (1987), Muniroh et al., (2017), if a pair of series, X_t and Y_t , are co-integrated, a generating mechanism called the "Vector Error Correction Model" exists that drives the variables

closer together over time while permitting a variety of short-run dynamics. The vector error correction model is also very helpful since it gives analysts the ability to predict both the immediate and long-term effects of variables on time series data.

The equation of Vector Error Correction Model (VECM) is obtained after differencing the VAR model.

Conventionally, the VAR model is written as follows:

$$\begin{aligned} \Delta \ln gdp_t &= \alpha_1 + \sum_{i=1}^k \beta_i \Delta \ln gdp_{t-1} + \sum_{m=1}^k \Phi_j \Delta \ln zakati_{t-1} \\ &\quad + \sum_{m=1}^k \varphi_m \Delta HDI_{t-1} + \sum_{m=1}^k \Theta_n \Delta POR_{t-1} + \mu_{1t} \\ \Delta \ln zakat_t &= \alpha_2 + \sum_{i=1}^k \beta_i \Delta \ln gdp_{t-1} + \sum_{m=1}^k \Phi_j \Delta \ln zakati_{t-1} \\ &\quad + \sum_{m=1}^k \varphi_m \Delta HDI_{t-1} + \sum_{m=1}^k \Theta_n \Delta POR_{t-1} + \mu_{2t} \\ \Delta HDI_t &= \alpha_3 + \sum_{i=1}^k \beta_i \Delta \ln gdp_{t-1} + \sum_{m=1}^k \Phi_j \Delta \ln zakati_{t-1} \\ &\quad + \sum_{m=1}^k \varphi_m \Delta HDI_{t-1} + \sum_{m=1}^k \Theta_n \Delta POR_{t-1} + \mu_{3t} \\ \Delta POR_t &= \alpha_4 + \sum_{i=1}^k \beta_i \Delta \ln gdp_{t-1} + \sum_{j=1}^k \Phi_j \Delta \ln zakati_{t-1} \\ &\quad + \sum_{m=1}^k \varphi_m \Delta HDI_{t-m} + \sum_{n=1}^k \Theta_n \Delta POR_{t-n} + \mu_{4t} \end{aligned}$$

After differencing VAR model that means we reduced lag length by one, we find the vector error correction model. Following are a set of equations of the chosen model:

$$\begin{aligned} \Delta \ln gdp_t &= \alpha_1 + \sum_{i=1}^{k-1} \beta_i \Delta \ln gdp_{t-1} + \sum_{m=1}^{k-1} \Phi_j \Delta \ln zakati_{t-1} \\ &\quad + \sum_{m=1}^{k-1} \varphi_m \Delta HDI_{t-1} + \sum_{m=1}^{k-1} \Theta_n \Delta POR_{t-1} \\ &\quad + \lambda 1ECT_{t-1} + \mu_{1t} \end{aligned}$$

$$\begin{aligned} \Delta \ln zakat_t &= \alpha_2 + \sum_{i=1}^{k-1} \beta_i \Delta \ln gdp_{t-1} + \sum_{m=1}^{k-1} \Phi_j \Delta \ln zakat_{t-1} \\ &+ \sum_{m=1}^{k-1} \varphi_m \Delta HDI_{t-1} + \sum_{m=1}^{k-1} \Theta_n \Delta POR_{t-1} \\ &+ \lambda_1 ECT_{t-1} + \mu_{2t} \\ \Delta HDI_t &= \alpha_3 + \sum_{i=1}^{k-1} \beta_i \Delta \ln gdp_{t-1} + \sum_{m=1}^{k-1} \Phi_j \Delta \ln zakat_{t-1} \\ &+ \sum_{m=1}^{k-1} \varphi_m \Delta HDI_{t-1} + \sum_{m=1}^{k-1} \Theta_n \Delta POR_{t-1} \\ &+ \lambda_1 ECT_{t-1} + \mu_{3t} \\ \Delta POR_t &= \alpha_4 + \sum_{i=1}^{k-1} \beta_i \Delta \ln gdp_{t-1} + \sum_{j=1}^{k-1} \Phi_j \Delta \ln zakat_{t-1} \\ &+ \sum_{m=1}^{k-1} \varphi_m \Delta HDI_{t-m} + \sum_{n=1}^{k-1} \Theta_n \Delta POR_{t-n} \\ &+ \lambda_1 ECT_{t-1} + \mu_{4t} \end{aligned}$$

Where:

$\ln gdp$: natural logarithm of real GDP

$\ln zakat$: Natural logarithm of Distributed zakat

HDI: Human Development Index

POR: Poverty Rate

$k - 1$ = the lag length is reduced by 1

$\beta_i, \Phi_j, \varphi_m, \Theta_n$ = short-run dynamic coefficients of the model's adjustment long run equilibrium.

λ_i = speed of adjustment parameter with a negative sign

ECT_{t-1} = error correction term, it contains the short run information derived from the long run co-integration relationship.

μ_{it} = residuals

Result and Discussion

Summary of Descriptive Statistics

We start our analysis with the descriptive statistics. In Table 1 below, we summarise the descriptive statistics parameters. We have mean, median, maximum, minimum and standard deviation. These results show that the variable distributed zakat (Zakat) has a

maximum value of 19597401, and a minimum value of 8152,230. These values show that at the beginning, the amount of distributed zakat in Indonesia was USD 8152,230 and has increased to around USD 19.597.401 recently. It means that distributed zakat inside the economic sector has recorded a potential growth in Indonesia; this could be due to the strong policies applied by the government in order to promote the development of Islamic social finance throughout the country. Therefore, this growth implies that there is a huge percentage of shares of zakat in the economic sector. Similarly, GDP depicts a substantial growth. Starting at USD 1.71e+11 it has reached higher in recent years, to almost USD 1.12E+12. Moreover, these results also show that the median of these variables is less than the mean. Therefore, it indicates a positive skewness among all the variables.

Table 1: descriptive statistics

	ZAKAT	GDP	HDI	POR
Mean	4281764.	6.79E+11	0.667500	12.80850
Median	1693623.	8.08E+11	0.670000	12.10000
Maximum	19597401	1.12E+12	0.720000	31.20000
Minimum	8152.230	1.71E+11	0.610000	0.970000
Std. Dev.	5879932.	3.26E+11	0.035522	8.320955
Skewness	1.432442	-0.273463	-0.107067	0.373621
Kurtosis	3.767981	1.521865	1.616609	2.219807
Jarque-Bera	7.331128	2.070009	1.633019	0.972559
Probability	0.025590	0.355225	0.441972	0.614910
	ZAKAT	GDP	HDI	POR
Sum	85635284	1.36E+13	13.35000	256.1700
Sum Sq. Dev.	6.57E+14	2.02E+24	0.023975	1315.527
Observations	20	20	20	20

Unit Root Test: The ADF Test and PP Test

Table 2 above shows the result of the two tests performed on the variables. The null hypothesis is: H0: there is a unit root (series are non-stationary). If the prob value is less than 0.05 at 5%

significance level, we reject this hypothesis; hence the series is stationary.

At level all of the four variables are non-stationary in the ADF test (prob values are higher than 0.05), but stationary in the PP test (prob values are less than 0.05). To make these series stationary, we use the differentiation method (1st difference and 2nd difference).

For lnzakat, lnGDP HDI, and POR, the p values are respectively, 0.0100, 0.0060, 0.0124 and 0.0000. These values are individually less than 0.05 in the ADF test so we reject the null hypothesis and we conclude that these variables are stationary. Similarly, for the PP test the p values, for each variable are less than 5% significance level. Globally we conclude that these series are all stationaries. As a result, the co-integration test can be used to investigate the relationship between variables.

Table 2: the ADF test and PP test

variables	ADF			Philip-Perron (PP)		
	LEVEL	1st difference	2nd difference	LEVEL	1st difference	2nd difference
Lnzakat	0.1288	0.0081	0.0100	0.0814	0.0000	0.0001
LnGDP	0.9699	0.0539	0.0060	0.9699	0.1127	0.0000
HDI	0.9756	0.0000	0.0124	0.1780	0.0000	0.0001
POR	0.0016	0.0163	0.0000	0.0141	0.0000	0.0000

prob values, 5% significance level

Co-integration test: The Johansson co-integration test

To examine the relationship between zakat, economic growth, human development index and poverty rate, we performed the Johansen co-integration test. The results of this test are shown in tables 3 and 4. For the first result (table 3) we used trace statistics to interpret the test. The null hypothesis is that H0: there is no co-integration between zakat, Gross Domestic Product (GDP), Human Development Index (HDI) and poverty rate (POR). If the value of

trace statistic is higher than the critical value, we reject the null hypothesis and we conclude that there is co-integrating relationship among the variables. In the results, trace test indicates 4 co-integrating equations in null hypothesis. All the prob values are less than 0.05 so we reject the null hypothesis of no co-integration among the variables. Thus, all the four (04) variables are co-integrated.

Table 3 trace statistics

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.762145	66.33285	47.85613	0.0004
At most 1 *	0.648348	40.48318	29.79707	0.0020
At most 2 *	0.474765	21.67115	15.49471	0.0052
At most 3 *	0.428816	10.08078	3.841465	0.0015

For the second result (table 4), we used the maximum Eigen value. We see that the p value of null hypothesis (at most 3*) is less than 0.05, at 5% level of significance. That means we reject the null hypothesis of no co-integrating relationship between the variables.

Generally, for the co integration test from the two tables, we conclude that there are co-integrating relationship between the variables. It indicates that in the long run there is evidence of relationship between zakat, Gross Domestic Product (GDP), Human Development Index (HDI) and poverty rate (POR).

Table 4 maximum eigenvalue

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.762145	25.84968	27.58434	0.0820
At most 1	0.648348	18.81203	21.13162	0.1024
At most 2	0.474765	11.59037	14.26460	0.1270
At most 3 *	0.428816	10.08078	3.841465	0.0015

Estimation of vector Error Correction Model (VECM).

All of the above steps are performed in order to estimate the impact of distributed zakat on economic growth, human development index and poverty rate. After the steps of stationarity of the series, and co integration between the variables, we understand that vector error correction model (VECM) is suitable for estimating the short and long run relationship between distributed zakat, economic growth, human development index and poverty rate. According to Davidson et al. (1995) if the variables are stationary in 1st difference and co-integrated, VECM is the right method to apply.

Table 5 and table 6 present the output of short run and long run effect of distributed zakat on economic growth (GDP), Human Development Index (HDI) and Poverty rate (POR).

Table 5: short run model

Error Correction:	D(LNZAKA T)	D(LNGDP)	D(POR)	D(HDI)
CointEq1	-0.683121 (0.45468) [-1.50243]	0.157499 (0.12657) [1.24434]	14.73150 (4.58312) [3.21429]	-0.007312 (0.01766) [-0.41398]
D(LNZAKAT(-1))	0.116491 (0.32552) [0.35787]	-0.038646 (0.09062) [-0.42648]	-7.257468 (3.28120) [-2.21184]	0.003731 (0.01265) [0.29502]
D(LNGDP(-1))	0.576982 (1.21352) [0.47546]	0.719476 (0.33782) [2.12976]	18.49799 (12.2323) [1.51223]	-0.019396 (0.04714) [-0.41145]
D(POR(-1))	-0.001922 (0.01097) [-0.17521]	-0.000657 (0.00305) [-0.21522]	-0.114448 (0.11060) [-1.03480]	-0.000137 (0.00043) [-0.32105]
D(HDI(-1))	-14.35189 (11.5027)	2.802178 (3.20210)	52.79537 (115.946)	-0.963730 (0.44684)

	[-1.24770]	[0.87510]	[0.45534]	[-2.15675]
C	0.204113	-0.004551	-1.025209	0.010874
	(0.08425)	(0.02345)	(0.84923)	(0.00327)
	[2.42272]	[-0.19405]	[-1.20722]	[3.32259]

Table 6: Long Run Model

Cointegrating Eq:	CointEq1
LNZAKAT(-1)	1.000000
LNGDP(-1)	-1.836582
	(0.17375)
	[-10.5700]
POR(-1)	-0.062604
	(0.01008)
	[-6.21023]
HDI(-1)	-26.34278
	(2.66214)
	[-9.89535]
C	34.00853

Because their respective t-values are lower than the 5% critical threshold ($cv=2.92$), the results show that all three variables—GDP, HDI, and POR—are statistically significant. This conclusion may be drawn from the findings presented here. As a consequence of this, zakat that is distributed has a considerable effect, over the course of time, on measures of economic growth (GDP), human development index (HDI), and poverty rate. (POR). Based on these findings, it appears that zakat that is disbursed has a favorable influence on GDP growth both in the short run and the long run. This highlights the fact that zakat has a direct influence on the functioning of the actual economy by contributing to the availability of resources for the

consumption and production of goods within the community. To stimulate overall economic expansion, therefore, solutions will be explored to strengthen output and consumption. Yusoff (2011) and Suprayitno (2020) came to comparable conclusions in their research. In addition, it is possible to claim that zakat institutions develop distribution strategies that address at least five different sectors. These sectors include the social, economic, and religious (Da'wah) components of education. As more money is given as zakat to various charities and organizations, a country's overall economic well-being will begin to improve.

Zakat that is dispersed across the community plays an important part in the field of development. The logical conclusion that can be drawn from these findings is that scattered zakat has a positive effect on the human development index. (HDI). In a manner that is consistent with the conclusions reached by Ibrahim (2015), Suprayitno et al. (2017) postulated that zakat is a factor in the human development index. (HDI). According to this, zakat is able to contribute to an increase in the human development index. In addition, the charity known as zakat is distributed to eight categories of people who are considered to be the most defenseless members of society; this has the potential to foster the growth of the eight categories of people who are mentioned in the Quran. As a consequence of this, extending assistance to such individuals will result in growth across the entirety of the nation and society. In addition, more than 4,500 people in four isolated regions of Indonesia now have access to electricity thanks to the establishment of micro hydropower plants by BAZNAS and the UNDP, which was the first big cooperation effort between the two organizations. The Global Environment Facility is providing financial support for this project so that it can be included in a bigger renewable energy strategy. Communities that now have access to energy will benefit economically from future Zakat projects, which will also contribute to the conservation of wildlife. It is feasible to envision how zakat could

promote the creative capacities of people and communities through such initiatives, as an alternative to merely supporting consumptive or humanitarian endeavors such as paying for medical expenditures and disaster assistance (UNDP Annual Report, 2018). This illustrates that the distribution of zakat has a positive influence on both the general welfare of society and the expansion of the economy. In the case of poverty, distribution has a significant and significant long-term impact on the decrease of poverty. Based on our results, it is assumed that distributing zakat will, in the long run, be able to reduce the rate of poverty and maintain economic well-being. On the other hand, Yaumidin (2014) came to the conclusion that zakat had no impact whatsoever on the alleviation of poverty. This finding contradicts that conclusion. In contrast to the present findings, which reflect empirical results and recent investigation, this study only covered a very small portion of time before the year 2010. Again, in the long run, the distribution of zakat will have a big impact on GDP, which in turn can have a knock-on effect on the poverty rate, which in turn will have a significant impact on the amount of poverty that is alleviated (Ayuniyyah et al., 2022). Once more, our calculations suggest that the amount of zakat that is distributed accounts for around 6% of the expansion of Indonesia's economy. In addition, the quantity of zakat that is given to those who are eligible to receive it will, in the long run, be productive and will serve as a source for the relief of poverty.

In general, these findings showed that an increase in zakat in the near term is possible to improve the standard of education and social welfare in the community. An increase in the amount of zakat that is distributed will, in the long run, have an effect on consumption, investment, and employment, as well as stimulate zakat beneficiaries to become zakat providers. As a result of this, the principal goals of zakat distribution, which pertain to the maintenance of zakat funds and the expansion of the economy, will be successfully accomplished. As a result, we are in a position to

attest to the substantial impact that zakat has on the growth of an economy that is sustainable.

Moreover, we also analyze the impulse response function. It shows the response of each to shock of one another in the long run. Figure 1, 2 and 3 shows the response of the variables GDP, HDI and POR to the induction of zakat.

Figure 1 explained that from period 1 to 3 distributed zakat increases the economic growth to a maximum level in period 3. After that GDP responds constantly to the shock of zakat without any decreases in the long run. Therefore, it implies the positive impact of zakat on economic growth.

Figure 2 also shows that for each period, HDI is decreasing but, with the impulse of distributed zakat it responds positively. Thus, in the long run, the human development index responds positively to the variation of distributed zakat. On that account, it shows the positive relationship between zakat and human development index.

Figure 3 also shows that, from the beginning, zakat was able to lower the poverty rate. Some variations are observed due to the shock of the economic sector. However, in the long run, distributed zakat tends to lower poverty rate. Hence we can affirm the crucial impact of zakat on poverty alleviation in the long run.

Figure1

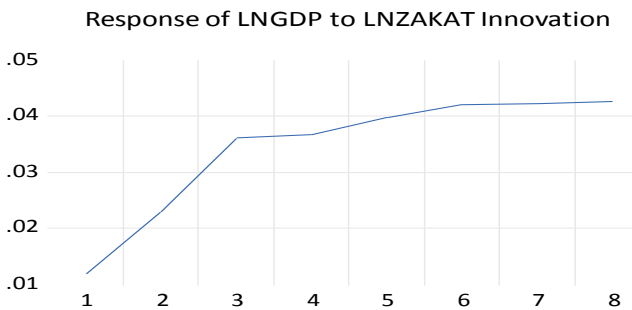


Figure 2

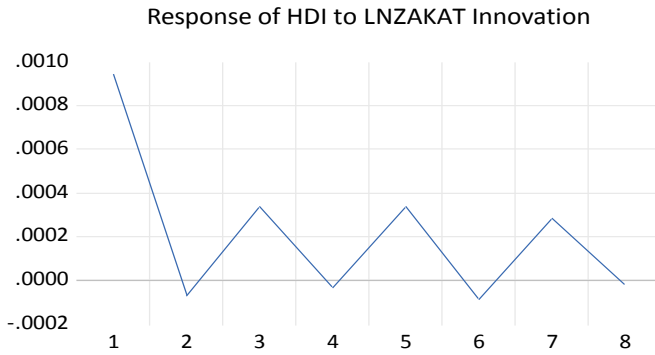
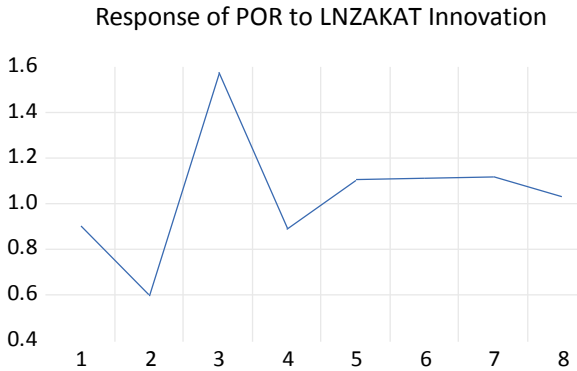


Figure 3



Model Diagnostics.

We performed some diagnostics tests to see how our estimation results can be taken into consideration. We used the following tests: autocorrelation test, heteroscedasticity test and normality test. The results of these tests are presented in table 7 below.

Table 7: Diagnostics tests

Diagnostics Tests	Type of tests	Prob value at 5% level of significance
Autocorrelation Test	Breusch–Godfrey Test	0.3983
Heteroscedasticity Test	White Test	0.4501
Normality Test	Jarque-Bera	0.8640

For autocorrelation test we used the Breusch–Godfrey test. It is a test for autocorrelation in the errors in a regression model. It makes use of the residuals from the model being considered in a regression analysis, and a test statistic is derived from these. The null hypothesis is that there is no serial correlation of any order up to p . Secondly, for heteroscedasticity test the null hypothesis of white test is that the variances for the errors are equal. Finally, for normality test is the null hypothesis of the Jarque-Bera test is a joint hypothesis of the skewness being zero and the excess kurtosis being zero. With a p -value >0.05 , one would usually say that the data are consistent with having skewness and excess kurtosis zero.

From the results we see that the prob values are higher than 0.05 so we reject the null hypothesis and we accept the alternative hypothesis. Therefore, we conclude that there is no serial correlation within the observation of the variables, the variances for the errors are equal means that there is no heteroskedasticity errors and finally, the data are normally distributed.

Conclusion

To sum up, the present paper shows the short run and long run impact of distributed zakat on sustainable economic development in Indonesia. We used a vector error correction model (VECM) with associated estimation tools such as stationary test, co-integration test, and impulse response function. We used time series

data to estimate the VECM model. Our results suggest that there is a positive impact of distributed zakat on sustainable economic development. Therefore, it demonstrates that the increase in zakat in the short run is able to increase the quality of education and social welfare. This draws attention to the fact that zakat has a direct impact on the real economy by supplying resources for societal consumption and production. Improvements in production and consumption will therefore be found to boost economic growth.

In the long run, an increase in distributed zakat will influence consumption, investment, employment and also motivate zakat beneficiaries to become zakat suppliers. Consequently, the primary objectives of zakat distribution related to sustainable zakat funds and economic growth will be successfully achieved. Zakat organizations design distribution strategies that take into account at least five different areas, including the educational process, social, economic, and religious (Da'wah) facets. An increase in zakat donations to various channels will boost a country's economic health.

To promote and achieve sustainable development goals, we recommend that the Indonesian government should implement tax reduction policies for zakat institutions to assist them in optimizing collection and distribution schemes. In addition, zakat institutions are also recommended to expand their distribution to reach people that are more vulnerable so that it could have a crucial impact on poverty alleviation and enhance sustainable development. However, one of the limitations of the research is the case study of only one country, Indonesia, so it is suggested to include more countries in order to generalize the results.

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