

USING HOLT WINTER 2 VARIABLE MODELLING TO ANALYZE THE POTENTIAL COMBINING OF ZAKAT COLLECTION IN THREE COUNTRIES IN SOUTHEAST ASIA AS ONE BUSINESS CENTRE

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ABSTRACT

The Covid 19 outbreak has taught businesses all over the world that they must have a business that can not only survive but also thrive in the face of the pandemic. The income from the Zakat, which is one of Islam's teachings about stable business, tends to rise despite the pandemic. As most Muslim countries on the planet, Indonesia, Malaysia, and Singapore have shown that their Zakat Organization, which is utilized to gather gifts from the public every year, expanded dramatically during the pandemic. The primary focus of this investigation will be the data on annual income from Indonesia, Malaysia, and Singapore, three of the world's most Muslim nations. The fact that some businesses will always be loyal to the government is the foundation of the statistical modeling theory that aims to predict the annual zakat income in five and ten years. Holt Winter's statistical modeling of two variables will be used to guarantee accurate forecasting. It accurately generates comparable annual data for the three nations. Likewise, that might act as a strong starting point for using measurable displaying to gauge the zakat gathered in the resulting five and a decade. The zakat revenue will continue to significantly rise in each nation as the study concludes. This result also indirectly demonstrated that businesses in every nation will be able to combine zakat as a blessing without experiencing deflation in Southeast Asia.

Keywords : Zakat, Holt Winter, Covid-19, Forecast, Statistical Modelling

1. Introduction

The work of charities was more crucial than ever in the years 2020 and 2021 as wealthy and impoverished nations struggled to recover from the effects of the coronavirus pandemic. But due to a dramatic decline in donations, many of these organizations were fighting to exist. Zakat, a concept that was largely unknown outside the Muslim world until a decade ago (<https://www.agbi.com/articles/zakat-can-save-the-world-islamic-giving/>), is now being used by an increasing number of non-Muslim charities to resist this menace. Zakat in the context of syara' refers to the issuance of a specific amount of property to be given to those eligible to receive it in accordance with the conditions established by Islamic law (Ganiyev & Umaraliev, 2020). One of the tenets of Islam, zakat, obligates Muslims to donate a portion of their permissible wealth (2.5 percent for the lunar year calendar and 2.5775 percent for the solar year calendar) each year in order to support the less fortunate. Zakat serves as an effort to free Muslims from the chains of poverty and social injustice as well as a ritual devotion that Muslims are required to do (Priatmoko & Putri, 2021). Planning and organization are used to manage zakat in order to carry out the activities of collecting, distributing, and using zakat monies effectively and efficiently (Friantoro, & Zaki, 2018). It is anticipated that zakat will lessen socioeconomic inequality. In addition, it is anticipated that zakat will help the populace's economic (Rachman, 2022; Hassan, et al., 2018).

The management of zakat, which is very important, includes distributing zakat. Therefore, expert zakat money distribution optimization will have a greater influence on wealth sharing initiatives. There are two ways to distribute zakat effectively first, by giving zakat money directly to *mustahik* for development (Friantoro, & Zaki, 2018). Money from zakat belongs to all

mustahik. Another name for this distribution is non-investment productive zakat. Making an investment with productive zakat is the second way to distribute it. This structure intends to cycle corporate capital, which no longer belongs to just one *mustahik* but instead becomes collective property (Lubis, & Azizah, 2018). It is anticipated that zakat will lessen socioeconomic inequality. In addition, it is anticipated that zakat will help the populace's economic (Rachman, 2022). The management of zakat, which is very important, includes distributing zakat. Therefore, expert zakat money distribution optimization will have a greater influence on wealth sharing initiatives. There are two ways to distribute zakat effectively: first, by giving zakat money directly to *mustahik* for development (Friantoro, & Zaki, 2018). Money from zakat belongs to all *mustahik*. Another name for this distribution is non-investment productive zakat. Making an investment with productive zakat is the second way to distribute it. This structure intends to cycle corporate capital, which no longer belongs to just one *mustahik* but instead becomes collective property, cooperation or shares, and others (Haron, et al., 2010). As a result, zakat applies to all business types that provide goods or services that comply with the standards (Mohd, et al., 2017). The asset keeps growing each year in order to develop into company capital that can support the local economy.

Numerous statistical techniques can be used to forecast because the amount of zakat being collected is increasing exponentially. Future zakat collection in Muslim-majority nations like Indonesia, Malaysia, and Singapore will require a lot of forecast data. Assets in the form of zakat collection, which tend to rise annually, offer a chance to turn zakat into a business that is run jointly by the three nations. By issuing quantifiable work programs with accessible and measurable financing sources in the results of these work programs, which will ultimately have an impact on improving the welfare of the population, the three countries will be able to use these assets in improving the economy of the population. Forecasting is a crucial tool for good planning, particularly in economics and commercial organizations where decision-making is crucial.

The foundation for the company's short- and long-term strategy is forecasting. Making predictions about the values of important variables for the future based on historical and present data is known as forecasting. In general, forecasting is a difficult endeavor, which is why many scholars have been drawn to study it. In order to forecast the possibility for zakat in Iran, some researchers have studied zakat models employing mathematical equations, the accuracy and repeating characteristic of the Fourier series in the Matlab application (Namdar, & Hassanzadeh, 2021). In the meantime, the multiplicative decomposition forecasting approach was used to assess future zakat potentials and found that Indonesia's voluntary zakat had an impact on overall zakat collection (Al Parisi, 2017). In the meantime, a more involved study using a stochastic model to look at the dynamics of the wealth distribution of individuals in a population that adheres to zakat systems (Bin, et al., 2010) discovered that voluntary zakat in Indonesia affects the total zakat collection. This study used the multiplicative decomposition forecasting method to determine the zakat potentials in the future. The study of zakat modeling has grown significantly in Indonesia as well, particularly for the aim of forecasting zakat's worth in the future. According to a recent study that forecasted zakat, Holt's Exponential Smoothing (HES) model is a better choice for forecasting zakat data in Indonesia (Akbarizan, et al., 2016; Ilyas, et al., 2017; Ishak & Jaapar, 2020).

It is also well known that zakat funds are extremely steady and untouched by the COVID-19 outbreak. According to research done in Indonesia, zakat donations will continue to rise sharply in 2020 and 2021 (Sari, et al., 2022). Exponential Regression and Exponential Smoothing 2 Variables are two statistics models. To show that the suggested model is appropriate for characterizing data of zakat features, it is compared to existing statistical functions (Amri, et al., 2022). This study focuses on predicting future zakat collections for three Southeast Asian nations with the highest Muslim populations, including Indonesia, Malaysia, and Singapore. The statistical model in question will be created in this study using Holt Winter 2 variable statistical modeling. This research will be successful in providing an overview of good potential if joint management of zakat collections from the three countries is carried out using data on annual zakat collections for 19 years (2003-2021) obtained from official institutions that administer zakat from the three countries. The three nations can be encouraged to jointly decide on concrete measures

in the joint zakat management debate by receiving an overview of the amount of zakat that will be collected in the future.

2. Literature Review

Zakat is defined in Arabic as a means of blessing, sanctification, and development (*an-namaa*) (*al-barakatu*). Zakat is defined as the removal of certain property under specific circumstances for the purpose of giving it to a particular group (mustahik) with particular standards (Hafidhuddin, 2002). As stated by Allah in At Taubah verse 60, the recipient of Zakat is known as *mustahik*, which is comprised of eight groups (*ashnaf*), while the giver of Zakat is known as *muzaki*. Zakat is a special Islamic organization that helps to fight poverty (Kasri, 2016).

The third pillar of Islam's fundamental principles, Zakat, plays a crucial strategic role in promoting economic empowerment for individuals as well as societal welfare. This required worship has a significant social and economic impact on Muslims who receive it, in addition to providing recompense and purifying the body and soul for Muslims who perform it (Marizal & Sudibjo, 2020). Zakat is more voluntary than other financial resources because its major goal is to carry out divine orders and obtain Allah SWT's *ridha* and blessing. This makes it different from other financial resources. (Andiani, 2018). According to Budi and Krisnadi (2016), the financial services provided by fintech, including crowdfunding, mobile payments, and money transfer services, have revolutionized the startup business world.

As we all know, people want everything to be quick and simple, including paying zakat. The availability of fintech will make zakat payments simpler and easier. In comparison to the conventional method of paying zakat, the payment procedure will also be quicker. According to studies by Basuki & Husein (2018), Adhitya (2017), and Tsourela et al. (2007), fintech makes it easier to complete transactions, in this case the payment of zakat. The conventional method of zakat payment necessitates at the very least time, money, and exertion. People today always want everything to be handled effectively and economically. The existence of fintech provides the community with a solution to the issue. Fintech offers the benefit of being less expensive and more effective, according to studies by Saksonova & Merlino (2017), Adhitya, Imanuel (2017), Truong (2016), and Bhowmik & Johannes (2018), Marizal & Mutiarani (2022). Two things that are incredibly significant to someone are data and identity. In this day and age of technology, it is conceivable for data to be leaked and utilized arbitrarily for purposes that go beyond our expectations. Several scholars are concerned about this data and identity issue, including (Basuki & Hartina 2018; Medcraft 2016; Saksonova & Merlino, 2017; Mnuchin & Phillips, 2018).

The majority of zakat organizers use false information regarding zakat recipients, and there is no sufficient documentation to track the manner in which the relevant organization collects zakat (Lubis et al., 2011; Johari et al., 2015; Chatib et al., 2016). However, as required by law, organizations that deal with the public interest should be transparent about their finances (incomes and results) (Lubis, et al., 2018; Syafei, 2016). It is consistent with research showing that religious indicators are a crucial quality for increasing individual consciousness and preserving societal cohesion (Ahlan, 2015). As a result, there is a substantial correlation between zakat payers' degree of comprehension, literacy, attitude, and intention (Ali, et al., 2017).

Additionally, due to a lack of resources and transportation, there are no official officers in several cities and villages. Due to the high operational and coordination costs associated with manual processes and the remoteness of the ZMS center or major city, several locations have been neglected without adequate delegation mechanisms (Abdullatif, 2012). Maintaining social affordability and ensuring economic sustainability are the roles of zakat organizations. As a result of these environmental changes in contemporary societies, where some people are unwilling to adopt technological innovation and the use of new techniques, the process of arranging zakat faces a number of difficulties (Johari, et al., 2015). When creating internal control structures for zakat organizations, management must take into account the fundamental values of fairness, openness, accountability, responsibility, and independence. These principles relate to the provision of accurate and consistent data (Syafei, 2016). Incoordination and uncertainty are caused by a conflict of unclear jurisdiction between the zakat organization's functions of regulation, oversight, and execution (Sari, 2013). Importantly, the organization's commercial activity and goal should

be motivated by the spirit of defending Islam as the religion of all people in order for these fundamental tenets to be established (Saad, 2014).

However, certain organizational procedures in Indonesia use family business principles rather than professional ones, which jeopardizes their performance and future (Dewi & Dhewanto, 2012). If members of the family make mistakes or perform poorly, it can be very tough to chastise or be harsh with them. With regard to zakat collection and distribution, which has a gap of around 40%, there are a number of issues that arise in practice. In the meantime, there is a lack of data integration among zakat agencies, which makes it difficult to identify the right recipient to raise their standard of living (Sukmana, et al., 2017). Many applications, including decision support systems using the Analytical Hierarchy Process (AHP), Weight Product Method (WPM), Taxation System, Geographical Information System, Social Society Approach, etc., have been created to address various organizational difficulties (Lubis, et al., 2011; Abdullatif, 2022; Sukmana, et al., 2017; Maulana, 2017). If the zakat institution does not change their business model and procedure, those applications will be meaningless. On the other side, the public frequently complains that zakat did not reach the intended group as a result of a lack of authority publicity or a lack of understanding on the part of the community at large (Rahman, 2012).

Data

The data used in this research is annual zakat collection data for 19 years (2003-2021) obtained from the official website of zakat managers in Indonesia (<https://baznas.go.id/szn/statistik-zakat-nasional>), Malaysia (<https://www.zakat.com.my/info-ppz/report/book-report/>) and Singapore (<https://www.muis.gov.sg/Media/Annual-Reports>)

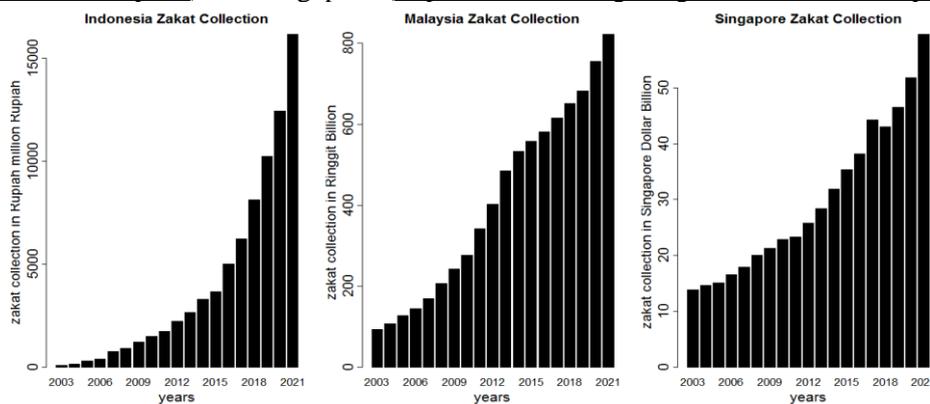


Fig. 1. Zakat Colecction in Indonesia, Malaysia and Singapore Data (2003-2021)

For each of the countries included in this study, Figure 1's time series barplot displays a pattern of a significant increase in zakat collection. This suggests obliquely that the annual zakat collection is an asset that keeps expanding. These kinds of assets are a very reliable source of financing for operations that can yield healthy earnings. With the largest Muslim population in the world, Indonesia has made a substantial contribution to the amount of zakat collected. As can be seen in Figure 1, zakat collection in Indonesia has grown dramatically each year

3. Research Methods

In Indonesia, Zakat is a requirement only for Muslims because it is one of Islam's five pillars. The non-believers are neither required to pay Zakat, nor would it be accepted from them if they do so voluntarily. The Nasional Zakat Board oversees zakat in Indonesia in accordance with law No. 23/2011 article 1. Zakat is managed by BAZNAS on a national level, and LAZ is a locally constituted organization tasked with assisting in its collection, distribution, and use. The Indonesian Zakat Payment Method was cleverly created to keep up with technology advancements.

In Malaysian, zakat; The way zakat is administered in Malaysia is influenced by its political system. Due to each state ruler's authority over religious matters, including zakat, zakat management in Malaysia is becoming more centralized at the state level. Different Malaysian states manage zakat in unique ways. Internet-based e-Zakat apps are used in Malaysia. The

government of Malaysia has the authority to collect zakat. For instance, the state of Selangor in Malaysia's Lembaga Zakat Selangor has its own Department of Asnaf Development, which is in charge of capital aid. This sum is added to other departments' budget investments. In Singapore, zakat; A strategic division of the Islamic Religious Council of Singapore, also known as Majlis Ulama Islam Singapura, is Zakat Singapore (Muis). It is in charge of managing and running the Singaporean Zakat money.

Variables Exponential Smoothing

The level and trend of the time series are estimated using smoothed versions in the Exponential Smoothing 2 Variables model. The forecast is then calculated by projecting the level and trend forward (Brooks, 2008; Jere, & Siyanga, 2016), provide the formulas that determine level and trend. This methodology is applied to data with a trend but no discernible seasonal pattern. An example of a set of observations in a time series is $X_1, X_2, X_3, \dots, X_n$ and X_n . Two smoothing constants could be used to create the Exponential Smoothing 2 Variables formula as shown below.

$$A_t = \alpha X_t + (1 - \alpha)(\alpha_{t-1} + T_{t-1}), 0 < \alpha < 1, t = 1, 2, \dots, n$$

$$T_t = \beta(A_t - A_{t-1}) + (1 - \beta)T_{t-1}, 0 < \beta < 1, t = 1, 2, \dots, n$$

For the forecast the series of \hat{X}_{t+p} can be obtained by $\hat{X}_{t+p} = A_t + pT_t, p = 1, 2, \dots, k$ and p is number of periods in the future. In this model for the first step is to obtain level estimate and trend estimate represented by A_0 and T_0 respectively. These estimates can also be determined by fitting a least squares trend line to half of the historical data. In the following equations, the intercept is A_0 and slope is T_0 . The value of α and β that minimizes Mean Square Error (MSE) is preferred. The formula is given as below respectively

$$MSE = \frac{1}{n} \sum_{t=0}^n (X_t - \hat{X}_t)^2$$

4. Results and Discussions

The descriptive statistics for zakat data are shown in Table 1 as the first piece of information in this study. The considerable (21255112) fluctuations in Indonesia's zakat data collection suggest that the zakat increase from the lowest value of 85.28 to the maximum value of 16160 from year to year is highly significant. The average amount of zakat collected was relatively considerable (4051), demonstrating that effective zakat administration can raise the standard of living for Indonesians. This conclusion might also be taken indirectly as showing that the Muslim population is generally well-off. In Malaysia, zakat collections increased noticeably from the lowest level of 92.9 to the highest level of 821.7, demonstrating a similar trend. The high variance figure also points to considerable fluctuations in the amount of zakat collected from year to year. The growth of zakat collections in Singapore, which have increased every year but not by a large amount, illustrates something quite different.

Table 1 - The descriptive statistics for zakat in Indonesia, Malaysia, and Singapore

Countries	Minimum	Mean	Varians	Maximum
Indonesia Zakat Collection	85.28	4051.00	21255112.00	16160.00
Malaysia Zakat Collection	92.90	409.90	57205.86	821.70
Singapore Zakat Collection	13.80	29.98	190.5936	59.50

Data from the years 2003 to 2021 were taken into consideration when fitting the zakat data that had been gathered. A statistical model like Exponential Smoothing 2 variables will be utilized to model the zakat. Figures 2, 3, and 4 depict the behavior of the models for the estimated parameters, and Table 2 displays the estimated parameters from the statistical models that were employed. Based on the behaviors models in Figure 2's Exponential Smoothing 2 Variables, which are represented by the green line and the black line, respectively (representing the zakat data recorded from 2003 to 2021), respectively, it can be inferred that this model collection for zakat in Indonesia is capable of producing good results for zakat data. Furthermore, zakat collection for the following five years will be predicted using this approach. The collecting zakat prediction for the years 2022 to 2026 is shown in figure 2 as a series of red, blue, green, yellow, and gray bar graphs. Zakat is a different type of business that has never seen its assets drop, even being affected by extraordinary occurrences like disasters and the Covid 19 virus attack, as shown by the results of forecasting zakat collection for the future.

Table 2 - Exponential Smoothing 2 Variables Parameters

Countries Zakat	alpha	beta
Indonesia Collection Zakat Model	0.8186698	1
Malaysia Collection Zakat Model	1	0.8762742
Singapore Collection Zakat Model	0.9389175	0.3443114

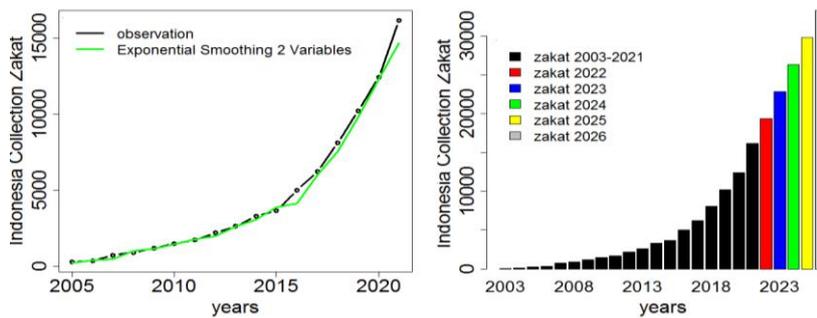


Fig. 2. Exponential Smoothing 2 Variables model fitted to the observation and forecasting the zakat collection in Indonesia respectively

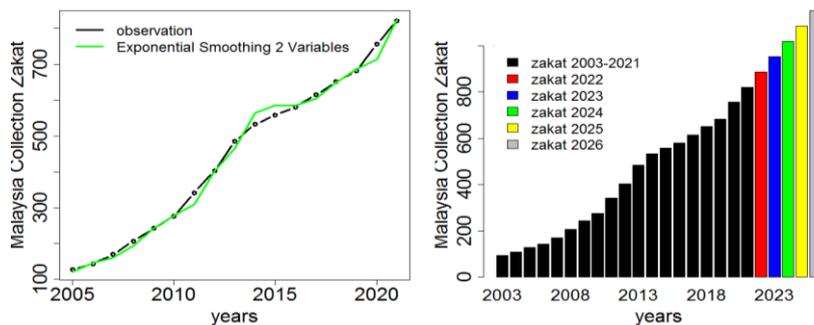


Fig. 3. Exponential Smoothing 2 Variables model fitted to the observation and forecasting the zakat collection in Malaysia respectively

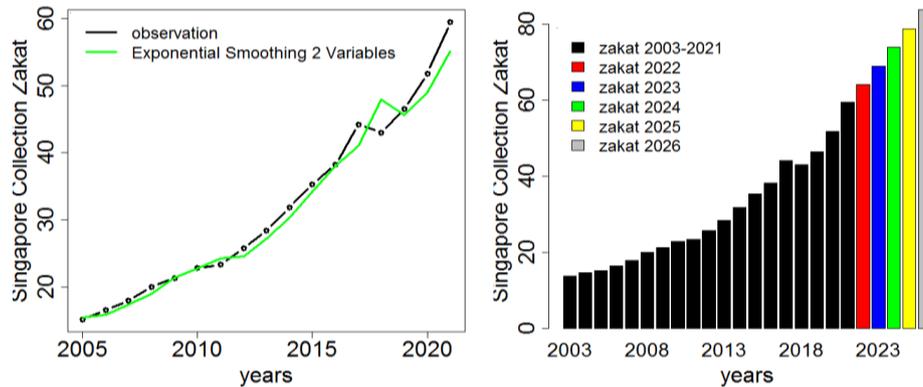


Fig. 4. Exponential Smoothing 2 Variables model fitted to the observation and forecasting the zakat collection in Singapore respectively

Demonstrates how the Holt Winter 2 variable model may be used to effectively address zakat collection in Malaysia. In the image, it can be observed that the green graph, which serves as the collection of zakat produced by the model, can reasonably resemble the real collection of zakat, which is shown by the black graph. The bar graph, which is represented by the red, blue, green, yellow, and gray bar graphs, respectively, shows the forecast of the zakat collection for the upcoming five years from 2022 to 2026. The results of this projection indicate that Malaysia's zakat assets would continue to increase fast in the future; this outcome is consistent with the growth of zakat collections in Indonesia, as previously indicated. While Figure 4 illustrates how zakat collection is described in Singapore, it also demonstrates how well the Holt Winter2 variable model approximates real zakat data. Zakat collections are expected to grow quickly between 2022 and 2026 according to forecast findings for the next five years as done for zakat collections in Indonesia and Malaysia. Zakat collection in Singapore is a resource that has the potential to be very helpful to Singaporeans if it is properly managed. The management of zakat collections, which are still administered by each nation, will significantly advance that nation. It would undoubtedly be beneficial if the management of the zakat collection could be carried out jointly given the three nations' geographical proximity to one another in Southeast Asia. If the merger of these assets is carried out and administered by an organization created by the three countries, this expanding zakat collection asset will be a fantastic source of business capital.

5. Conclusion

The opportunity for Indonesia, Malaysia, and Singapore to manage zakat collections as a business center with great potential to improve the welfare of their respective populations has been made possible by the zakat collection, which continues to rise every year in these three Southeast Asian countries with a Muslim majority. The zakat collection forecast results for the following five years likewise demonstrate that zakat collections are a sound asset that keep expanding significantly. It will be very beneficial for the country's economy to combine the three nations' zakat collections into one commercial enterprise. The combined zakat collection of these three nations is one of the factors supporting the ability of institutions formed by these three nations to manage the zakat collection. In addition, as previously mentioned, these three nations are geographically neighbors, but other than that, the population factor with the largest Muslim religion, the similarity of culture, and the similarity of language are factors that are equally important in the creation of a new business center.

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