Published: 29 October 2025

Predicting ZIS Institution Assets in Indonesia

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The Zakat, Infaq, and Alms (ZIS) industry in Indonesia has a strategic role in supporting social development and poverty alleviation. Along with the increasing public awareness of Islamic philanthropy, ZIS industrial assets show a significant growth trend year over year. This study aims to predict the development of total ZIS industrial assets in Indonesia in the coming period by using three forecasting methods, namely Trend Analysis (regress over time), Multiplicative Decomposition, and Exponential Smoothing with Trend. The data used is annual data on total ZIS industrial assets for the period 2002-2018 sourced from the Financial Services Authority (OJK). The results show that historically ZIS's industrial assets have increased significantly, from Rp68 billion in 2002 to Rp8,100 billion in 2018. The forecast results show that ZIS industrial assets are expected to continue to grow in the 2019–2023 period, despite variations in predictive values between methods. Based on the Mean Absolute Percentage Error (MAPE) indicator, the Trend Analysis and Multiplicative Decomposition methods show relatively better forecasting performance compared to the Exponential Smoothing with Trend method. These findings are expected to be a reference for regulators and managers of ZIS in formulating policies for the development of the Islamic philanthropic industry in Indonesia.

Keywords: Zakat; Infak; Almsgiving; Forecasting; Trend Analysis; Islamic Philanthropy

OPEN ACCESS
ISSN 2985-3257 (Online)

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Received: 11 June 2025
Accepted: 21 September 2025
Published: 29 October 2025

Citation:
(2025) Predicting ZIS Institution Assets in Indonesia. Islamic Social Finance, 5.1.

INTRODUCTION

Zakat, infaq, and alms (ZIS) are Islamic social financial instruments that have an important function in realizing social justice and community welfare. In the context of Islamic economics, ZIS is not only seen as an individual worship obligation, but also as a mechanism for income redistribution that has the potential to support inclusive and sustainable economic development (Chapra, 2000; Kahf, 1999).

Zakat, Infaq, and Alms (ZIS) constitute core instruments of Islamic social finance aimed at poverty alleviation, income redistribution, and social welfare enhancement. In Indonesia—the world's largest Muslim-majority country—ZIS plays an increasingly strategic role in supporting inclusive development, complementing state-led fiscal and social protection systems. Over the past two decades, Indonesia has experienced significant progress in the institutionalization, regulation, digitalization, and professionalization of ZIS management. Despite this progress, the realized collection remains significantly below its estimated potential, which is often cited to exceed hundreds of trillions of rupiah annually. This gap highlights challenges in compliance, literacy, and informal zakat practices.

In Indonesia, as a country with the largest Muslim population in the world, the potential and realization of ZIS collection continues to increase. The development of ZIS management institutions, both the National Amil Zakat Agency (BAZNAS) and the Amil Zakat Institute (LAZ), has also encouraged the growth of ZIS industrial assets nationally (Ascarya & Yumanita, 2018). However, the dynamics of ZIS's asset growth need to be analyzed quantitatively in order to provide a prospective picture of the industry's future sustainability.

The development of ZIS in Indonesia reflects a transition from traditional charity to a modern, institutionalized, and development-oriented Islamic social finance system. With continued regulatory support, digital innovation, and integration into national and global sustainability agendas, ZIS has strong potential to become a key driver of inclusive and equitable economic development in Indonesia (Setianingrum et al., 2019; As-Salafiyah & Rusydiana, 2023).

Zakat, Infaq, and Alms assets represent the accumulated financial and non-financial resources managed by zakat institutions for the purpose of social welfare, poverty alleviation, and economic empowerment. In Indonesia, ZIS assets have become an increasingly important component of the Islamic social finance ecosystem, complementing public fiscal instruments and commercial Islamic finance. Unlike zakat collection figures (which measure annual inflows), ZIS assets reflect the stock of managed resources, including cash balances, productive investments, infrastructure, and program-based assets. Empirical evidence from Indonesia suggests that productive zakat assets have a stronger and more sustainable impact than purely consumptive transfers, particularly when combined with mentoring and monitoring.

ZIS assets in Indonesia represent more than charitable funds; they are strategic Islamic social finance assets with the potential to generate sustainable socioeconomic impact. Strengthening asset management, governance, and integration with broader Islamic finance and ESG frameworks will be critical to maximizing their long-term contribution to inclusive development. However, the asset base remains underdeveloped relative to Indonesia's zakat potential, reflecting the dominance of short-term distribution over asset accumulation.

Forecasting is one of the important analytical tools in policy planning and strategic decision-making. By predicting the value of ZIS industrial assets, stakeholders can develop strategies for managing, distributing, and strengthening ZIS governance in a more targeted manner (Makridakis et al., 1998). Therefore, this study aims to predict the development of total ZIS industrial assets in Indonesia by using several forecasting methods commonly used in time series analysis, as well as evaluate the performance of each method based on the level of prediction error.

LITERATURE REVIEW

Zakat, infaq, and alms (ZIS) are the main instruments in the Islamic social finance system that function as a mechanism for wealth redistribution and poverty alleviation. In Islamic economic literature, zakat is seen as a fiscal obligation that has a macroeconomic impact, while infak and alms are voluntary but contribute significantly to social welfare (Kahf, 1999; Chapra, 2000).

Several studies confirm that effective ZIS management can increase the consumption of the poor, strengthen social capital, and support equitable economic development (Beik & Arsyianti, 2016). In Indonesia, the role of ZIS is increasingly strategic in line with the strengthening of regulations and institutions, especially after the issuance of Law Number 23 of 2011 concerning Zakat Management.

The ZIS industry in Indonesia has experienced significant development in the last two decades. Research by Ascarya and Yumanita (2018) shows that the growth of ZIS assets and collections is driven by increasing public religious awareness, professionalization of amil zakat institutions, and government policy support. BAZNAS and LAZ play a key role as key institutions in managing ZIS funds in a more transparent and accountable manner.

However, several studies also noted structural challenges in the ZIS industry, such as inequality in fund distribution, limited managerial capacity, and fluctuations in collections due to macroeconomic factors. Therefore, a quantitative analysis of ZIS industrial assets is important to understand its growth patterns and sustainability prospects.

Forecasting in Economic and Financial Analysis

Time *series forecasting* is a commonly used method to predict the value of economic variables based on their historical patterns. Makridakis et al. (1998) emphasize that forecasting serves as a strategic decision-making tool, especially in the context of medium and long-term planning.

The *Trend Analysis* method or regression to time is widely used to capture the linear growth trend of an economic variable. Meanwhile, the *Multiplicative Decomposition method* allows for the separation of trending, seasonal, and cyclical components in the data, making it more adaptive to structural fluctuations (Hyndman & Athanasopoulos, 2018). The *Exponential Smoothing with Trend* method is known to be effective for short-term predictions with greater weight on the latest data.

In the context of Islamic economics and Islamic philanthropy, the use of forecasting methods is still relatively limited. Some early studies have shown that the forecasting approach can be used to predict the collection of zakat and waqf to support more data-driven policy planning (Firdaus et al., 2012).

Empirical research related to ZIS forecasting in Indonesia shows mixed results depending on the method and data period used. Firdaus et al. (2012) found that the growth trend of national zakat tends to increase exponentially, even though it is vulnerable to economic shocks. However, studies that specifically compare several forecasting methods on total ZIS industrial assets are still relatively limited. Therefore, this study contributes to filling the gap in the literature by comparing the performance of several forecasting methods at once, as well as providing an empirical picture of the prospects for ZIS industrial assets in Indonesia.

DATA AND METHODOLOGY

The data used is the Total Assets of ZIS from 2002 to 2018. Data is taken from National Amil Zakat Agency (BAZNAS). Meanwhile, the prediction methods used in this study are 3 forecasting methods, namely: (1) Trend Analysis Method (regress over time), (2) Exponential Smoothing with Trend Method, and (3) Multiplicative Decomposition Method. The software used as a tool is QM version 3. POM-QM stands for production and operations management --- Quantitative Methods, an operations management software developed by Pearson Prentice Hall USA.

Trend analysis, multiplicative decomposition, and exponential smoothing are all time-series analysis methods, but they differ in purpose, structure, and how they handle components of the data. Below is a clear conceptual comparison. Trend analysis focuses on identifying the long-term direction of a time series over time (upward, downward, or stable), ignoring short-term fluctuations.

Multiplicative decomposition breaks a time series into distinct components: Trend (T); Seasonal (S); Irregular (I) and assuming these components interact multiplicatively. Meanwhile, exponential smoothing is a forecasting method that assigns greater weight to recent observations, allowing the model to adapt to changes.

RESULTS

Based on the results of data management that has been carried out. The results of the calculation of the prediction of the Total Assets of the ZIS Industry in Indonesia for the future are as attached in the following table. Based on table 1, in general, the assets of the ZIS Industry in Indonesia from 2002 to 2018 experienced a significant increase. If at the beginning of 2002 the value was only 68 billion Rupiah, the assets of the ZIS Industry asset in Indonesia in 2018 increased to 8100 billion Rupiah.

The calculation results predict that the assets of the ZIS Industry in Indonesia in 2019 with a trend analysis approach will decrease slightly to 6079.78 billion Rupiah, but increase to 6505.6 and 6931.42 billion Rupiah in 2020 and 2021. The assets of the ZIS Industry in Indonesia in 2022 and 2023 are predicted to increase to 7357.24 and 7783.05 billion Rupiah.

Table 1. Results of ZIS Asset Prediction in Indonesia

	Trend	Multiplicative Decomposition	Exponenial smoothing
2002	68	68	68
2003	85	85	85
2004	150	150	150
2005	296	296	296
2006	373	373	373
2007	740	740	740
2008	920	920	920
2009	1200	1200	1200
2010	1500	1500	1500
2011	1729	1729	1729
2012	2212	2212	2212
2013	2639	2639	2639
2014	3300	3300	3300
2015	3653	3653	3653
2016	5017	5017	5017
2017	6224	6224	6224
2018	8100	8100	8100
2019*	6079,78	6150,05	8705,24
2020*	6505,6	6456,64	
2021*	6931,42	7011,85	
2022*	7357,24	7302,17	
2023*	7783,05	7873,66	
MAP	2,11	2,11	0,19

The following is a graph of the trend method *analysis* (regress over time) for the assets of the ZIS Industry in Indonesia where the black line is real data and the dotted blue line is the prediction data.

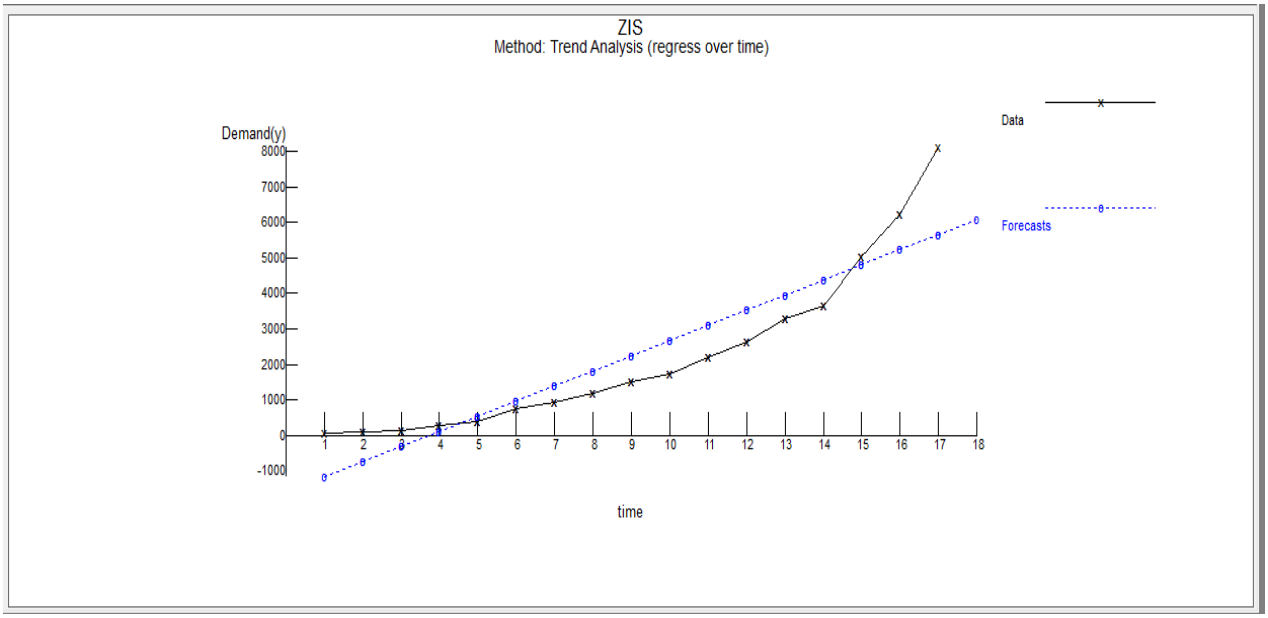

Figure 1. Trend *Analysis Method*

The results of the calculation of the predicted assets of the ZIS Industry in Indonesia in 2019 for the *Multiplicative Decomposition* quite a significant decrease to 6150.05 billion Rupiah, but increased to 6456.64 and 7011.85 billion Rupiah in 2020 and 2021. ZIS Industrial assets in Indonesia in 2022 and 2023 are predicted to experience a significant increase to 7302.17 and 7873.66 billion Rupiah. The following is a graph of the results of the *Multiplicative Decomposition* for ZIS Industrial assets in Indonesia where the black line is real data and the dotted blue line is the prediction data while the red color is the line of *trend*.

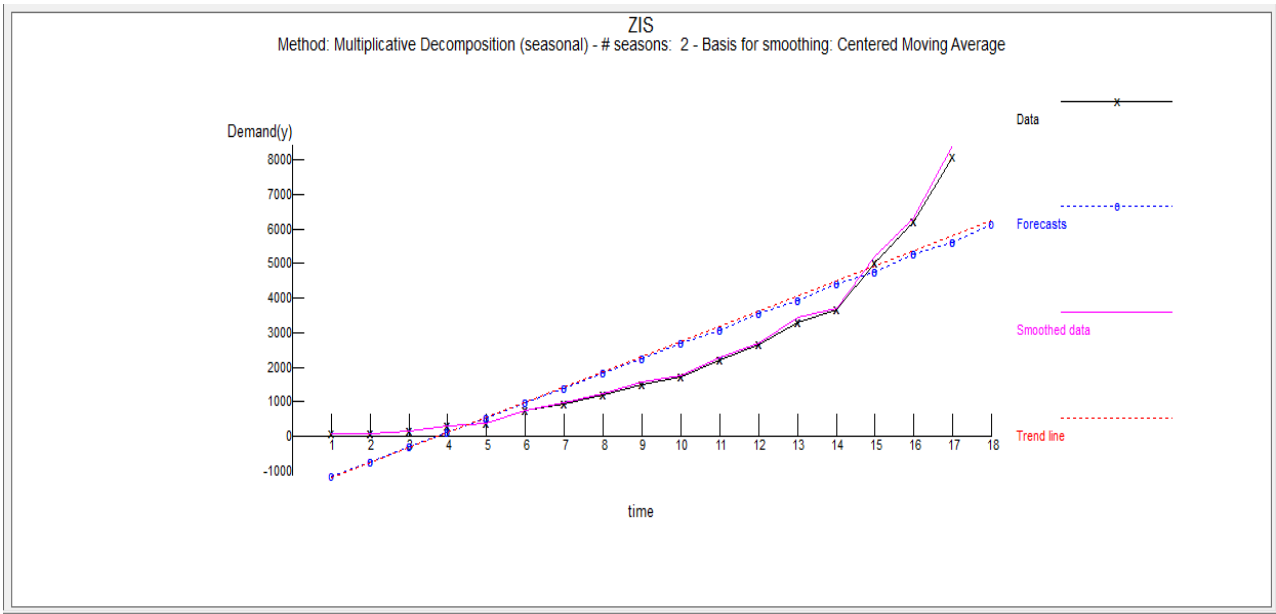

Figure 2. Method *Multiplicative Decomposition*

The last is the results of the measurement method *Exponential Smoothing with Trend*. The results of the calculation of the prediction of the assets of the ZIS Industry in Indonesia with the *Exponential Smoothing with Trend* It only covers or provides 1 year of data, namely in 2019. In 2019, the predicted assets of the ZIS Industry in Indonesia have increased significantly to 8705.424 billion Rupiah. The following is a graph of the method *Exponential Smoothing with Trend* for ZIS Industrial assets in Indonesia where the black line is real data and the dotted blue line is prediction data.

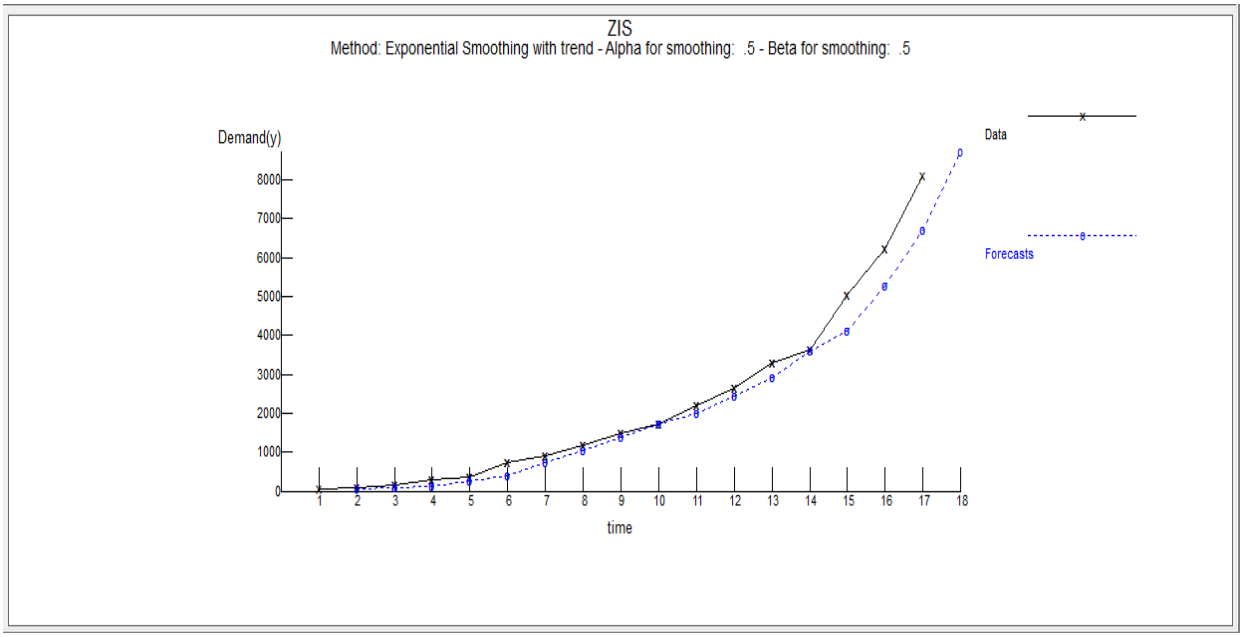

Figure 3. Method *Exponential Smoothing with Trend*

The MAPE (Mean Absolute Percent Error) value or the average error detection value for the three methods above is 2.11 for *Trend Analysis* and *Multiplicative Decomposition* while 0.19 for *the Exponential Smoothing with Trend method*. This means that the first 2 methods are relatively better at predicting compared to the third method (*Exponential Smoothing with Trend).*

The results of data processing showed that the total assets of the ZIS industry in Indonesia experienced a very significant growth during the observation period 2002–2018. This increase reflects the increasing public awareness of the obligations and roles of Islamic philanthropy, as well as the improving institutional governance of ZIS in Indonesia. This finding is in line with previous research that stated that strengthening zakat institutions and regulations contributes positively to increasing ZIS collection and assets (Beik & Arsyianti, 2016).

Based on *the Trend Analysis (regress over time)* method, the prediction results show a decline in ZIS industrial assets in 2019, but it will increase gradually again until 2023. This pattern indicates that despite short-term fluctuations, the long-term trend of ZIS assets still shows an upward trend. This method captures a linear growth pattern consistent with the characteristics of historical data.

The forecasting results using *the Multiplicative Decomposition* method show a relatively similar pattern, where the value of assets is predicted to decrease at the beginning of the forecast period, then increase significantly in the following years. The advantage of this method lies in its ability to separate the components of trends and data variations, thus providing a more stable picture of growth in the medium and long term (Hyndman & Athanasopoulos, 2018).

Meanwhile, the *Exponential Smoothing with Trend* method only produces predictions for one period in the future, namely 2019, with a relatively higher value than the other two methods. Although this method shows the smallest MAPE value, its limitations in generating medium and long-term predictions make it less optimal for the strategic planning needs of the ZIS industry.

The performance evaluation of the forecasting method based on the MAPE value shows that *the Trend Analysis* and *Multiplicative Decomposition methods* have a relatively low and stable error rate, so it is more suitable to be used in predicting the development of ZIS industrial assets in Indonesia. These findings reinforce the view that the selection of forecasting methods should be adjusted to the characteristics of the data and the objectives of the analysis (Makridakis et al., 1998).

CONCLUSION

This study aims to predict the development of total ZIS industrial assets in Indonesia in the coming period by using three forecasting methods, namely Trend Analysis (regress over time), Multiplicative Decomposition, and Exponential Smoothing with Trend. Based on the predictions, in the 2019 period it is estimated that the value of the Total Assets of the ZIS Industry in Indonesia will be in the range of 60 trillion to Rp. 80 trillion Rupiah. From these results, the pessimistic prediction value is at Rp. 60 trillion, the optimistic prediction value is at 80 trillion Rupiah. Meanwhile, the realistic predicted value of ZIS Industry assets in Indonesia is in the range of 61 trillion Rupiah. Based on statistical value indicators, in this case the MAPE value, *the Trend Analysis (regress over time)* and *Multiplicative Decomposition* methods are relatively better in predicting the value of ZIS Industry assets in Indonesia compared to the *Exponential Smoothing with Trend method*

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