

ABSTRACT

FORECASTING THE SALES OF SUBSIDIZED FERTILIZER USING THE SARIMA METHOD AND STL METHOD

by

Krishnamurti Dadi Pratomo

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This thesis investigates the use of SARIMA (Seasonal AutoRegressive Integrated Moving Average) and STL (Seasonal-Trend Decomposition using Loess) methods for forecasting the sales of subsidized fertilizer by PT PPI, a State-Owned Enterprise. The study utilizes sales data from January 2022 to June 2023 to build and compare forecasting models. Initially, the SARIMA method, with its ability to capture seasonal patterns and linear trends, demonstrated satisfactory performance. However, upon adjusting the seasonal parameter from a yearly to a quarterly cycle, the STL method proved to be more accurate.

Performance metrics, including Mean Squared Error (MSE), Root Mean Squared Error (RMSE), and Mean Absolute Percentage Error (MAPE), were used to evaluate the models. The results showed that while SARIMA provided a good baseline, the STL method, particularly with a quarterly seasonal parameter, achieved significantly lower errors across all metrics. Specifically, STL outperformed SARIMA with an MSE of 312,800,829,796, an RMSE of 559,286, and a MAPE of 18.14%, compared to SARIMA's higher errors.

The study concludes that STL is the more effective model for forecasting sales of subsidized fertilizer for PT PPI, providing a reliable tool that aligns better with the quarterly patterns observed in the data. This insight is crucial for optimizing resource allocation and improving forecasting accuracy.

Keywords : Subsidized Fertilizer, Time Series Forecasting, SARIMA, STL, Business Analysis