PREDICTING EACH TYPES MOTORCYCLE SALES IN JEMBER AND LUMAJANG REGENCY USING HIERARCHY FORECASTING WITH ARIMAX

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Abstract
Motorcycle is one of the products that has a rapid development this century. Based on information from “Asosiasi Industri Sepeda Motor Indonesia”, East Java Province is ranked as the highest sales of motorcycles. Motorcycle sales are not directly affected by the indicators of the Human Development Index (HDI). While in East Java Province, there are some areas that have the lowest HDI. These areas are called the “Tapal Kuda” area. This research will predict the type of motorcycle sales such as Cub, Matic, and Sport in two “Tapal Kuda” area that have the same characteristics which are Jember and Lumajang. Forecasting annual sales of motorcycles using the linear regression method, it’s known that annual sales of motorcycles in Jember and Lumajang significantly influenced by GDP per capita. While forecasting monthly sales of each type of motorcycle, not only using ARIMAX method but also hierarchy forecasting based on top-down method. When the pattern of Cub-type motorcycle sales in the two districts that tend to decrease and at risk of negative sales, then this can be explained by using this method. The results of the monthly forecasting each type of motorcycle in Jember and Lumajang indicate that hierarchy forecasting has a smaller sMAPE value, it means that the result of hierarchy forecasting is better than the direct forecast of ARIMAX.

Keywords : Motorcycles, Linear Regression, ARIMAX, Hierarchy Forecasting
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