Abstract

Construction of linear time series models to capture complex and various anomalies dataset structure is still a challenge. Application of such a time series model include the daily number Covid-19 outbreak. Today, the world still works hard to tackle and control this outbreak concerning in the increased levels of spread and severity. We propose an efficient technique for developing upper prediction for extreme value of daily Covid-19 increment rate following Seasonal Trend Loess (STL) Decomposition and Seasonal Autoregressive Integrated Moving Average (SARIMA) model. In particular, our key idea is to estimate Value-at-Risk (VaR) as upper limit using Variance Covariance simulation by identifying seasonal, trend and noise based the linear combination STL-SARIMA framework. Our simulation studies indicate that VaR provide sharp and well prediction with a MAPE results of 0.15 for extreme value with zero penalty. Since a number of positive cases has resulted unprecedented volatility, estimating the extreme value of increment rates become a crucial matter to support information and maintain essential health services. The proposed approach is illustrated by an application to the daily Covid-19 DKI Jakarta dataset.

Keywords: Autoregressive, Covid-19, Extreme value, Seasonal, Variance-Covariance, Value-at-Risk.