

## ABSTRACT

### DOMESTIC AIR PASSENGER FORECASTING IN INDONESIA WITH CALENDAR VARIATION EFFECTS USING A SEASONAL AUTOREGRESSIVE INTEGRATED MOVING AVERAGE WITH EXOGENOUS VARIABLES (SARIMAX) MODEL

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The number of domestic air passengers in Indonesia is influenced by trend patterns, seasonality, and external factors such as calendar variations. This study aims to obtain the best model for forecasting the number of domestic air passengers using the *Seasonal Autoregressive Integrated Moving Average with Exogenous Variables* (SARIMAX) method. The analysis stages include stationarity testing, model identification, parameter estimation using the *Maximum Likelihood Estimation* (MLE) method, model selection based on the *Akaike Information Criterion* (AIC) value and parameter significance, and model evaluation using the *Mean Absolute Percentage Error* (MAPE). The results show that the best model before the inclusion of exogenous variables is SARIMA  $(0, 1, 1)(1, 0, 0)_{12}$  with an AIC value of 1738.39. Based on the significance test, only the school holiday dummy variable is significant; therefore, the final model obtained is SARIMAX  $(0, 1, 1)(1, 0, 0)_{12}$  with the school holiday dummy variable as the exogenous variable. The model yields a MAPE value of 12.39%, indicating that it is suitable for forecasting the number of domestic air passengers.

**Keywords:** SARIMAX, variasi kalender, *dummy*, penumpang pesawat, peramalan.

## ABSTRAK

### PERAMALAN PENUMPANG PESAWAT DOMESTIK DI INDONESIA DENGAN EFEK VARIASI KALENDER MENGGUNAKAN METODE *SEASONAL AUTOREGRESSIVE INTEGRATED MOVING AVERAGE WITH EXOGENOUS VARIABLES (SARIMAX)*

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Jumlah penumpang pesawat domestik di Indonesia dipengaruhi oleh pola tren, musiman, serta faktor eksternal seperti variasi kalender. Penelitian ini bertujuan memperoleh model terbaik untuk meramalkan jumlah penumpang pesawat domestik menggunakan metode *Seasonal Autoregressive Integrated Moving Average with Exogenous Variables (SARIMAX)*. Tahapan analisis meliputi uji stasioneritas, identifikasi model, estimasi parameter menggunakan metode *Maximum Likelihood Estimation (MLE)*, pemilihan model berdasarkan nilai *Akaike Information Criterion (AIC)* dan signifikansi parameter, serta evaluasi menggunakan *Mean Absolute Percentage Error (MAPE)*. Hasil penelitian menunjukkan bahwa model terbaik sebelum penambahan variabel eksogen adalah SARIMA  $(0, 1, 1)(1, 0, 0)_{12}$  dengan nilai AIC sebesar 1738,39. Berdasarkan uji signifikansi, hanya variabel *dummy* libur sekolah yang signifikan sehingga model akhir yang diperoleh adalah SARIMAX  $(0, 1, 1)(1, 0, 0)_{12}$  dengan variabel eksogen *dummy* libur sekolah. Model menghasilkan nilai MAPE sebesar 12,39%, sehingga layak digunakan untuk peramalan jumlah penumpang pesawat domestik.

**Kata kunci:** SARIMAX, variasi kalender, *dummy*, penumpang pesawat, peramalan.