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Auto-regressive distributed lag model on forecasting tourist arrivals from Asian region to Sri Lanka

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When one analyzes the tourism industry in Sri Lanka, it clearly shows the historical development of tourist arrivals every year. The Asian region is the highest tourist producer to the tourism market in Sri Lanka. With the increase in tourist arrivals from the Asian region, the government needs a correct method of forecasting tourist arrivals to cope with uncertain situations and resource management. Therefore, this study focused on identifying a suitable model to test the ADLM on forecasting tourist arrivals to Sri Lanka from the Asian region.

Monthly tourist arrival data from 2009 to 2014 were obtained from statistical reports of 2009 and 2014 from the Sri Lanka Tourism Development Authority (SLTDA). Auto-regressive Distributed Lag Model (ADLM) was tested on forecasting tourist arrivals. One way Analysis of Variance (ANOVA) technique was used for overall model testing and t- test was used for individual parameter testing.

The residual plots, Anderson –Darling and Durbin- Watson tests for residuals were used as a model validation criterion. Stationary of the series was tested by Augmented Dickey-Fuller Test (ADFT) and Auto Correlation Function (ACF).The forecasting ability of the models was assessed by considering both relative and absolute measurements of errors.

ADFT and ACF confirmed the non-stationary of the series. The results revealed that lag 1 is significant. The P value of Anderson-Darling test was (P= 0.534) and the Durbin-Watson statistic was 1.93.It confirmed the normality and independence of residuals. Adjusted R^2 of the model is 76.8%. The Mean Absolute Percentage Error (MAPE) values of fitting and verification of model with lag 1 were 1.36 % and 1.03% respectively; Mean Absolute Deviation (MAD) was 0.133 and 0.110 of fitting and verification; Mean Square Error (MSE) was 0.028 and 0.012. It was concluded that the ADLM with lag one is suitable for forecasting tourist arrivals from Asian region to Sri Lanka. It is recommended to try other time series techniques; decomposition techniques, Circular Model and Seasonal Auto Regressive Integrated Moving Average (SARIMA) models to capture the seasonal behavior of the series.