MODELLING OF MONTHLY VEHICLE REGISTRATION IN SRI LANKA USING SARIMA APPROACH

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Transportation system is an integral part of the daily commercial and industrial economic activities of a country. The type and the number of the vehicles have played a key role for the transportation system of the country. Therefore, developing a time series model and forecasting the vehicle registration of various types has been a nature of interest in government policy makers and others. The monthly data on the registration of the various types of vehicles for a period of 197 months from (Jan 2000 to May 2016) have been collected from Department of Motor Traffic of Sri Lanka. The objective of this study is to identify the best fit time series model for each type of vehicles. As a consequence, the forecasts for future values have been reported by the identified models. The models employed in this study are seasonal autoregressive integrated moving average (SARIMA) models. Model parameters were estimated by using the maximum likelihood method. Further, forecasting accuracy measures, Akaike information criterion (AIC), and mean square error (MSE) were used to identify the best forecasting model based on the lowest measure of accuracy. The seasonal SARIMA$(2, 1, 1)(1, 0, 1)12$, SARIMA$(0, 1, 2)(0, 0, 1)12$ and SARIMA$(1, 1,0)(1, 0, 0)12$ were selected as the best models to forecast the registration of vehicles categorized as three wheelers, motorbikes and lorries respectively in Sri Lanka. Also, the forecasted values showed that the future number of monthly registration is expected to gradually increase (vis-à-vis last year) in all the three types of vehicles. The three wheeler model revealed that the forecasted monthly registration amount will increase July to December in 2017. Hence, it is advisable to improve a reliability of the road network system to in order to emphasise the essential development of the country.

Keywords: *SARIMA model, Forecasting, Vehicle Registration, Vehicle type*