

Geometric Brownian Motion Based New Hybrid Statistical Approach for Forecasting Time series Data under the Volatility

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The high volatile fluctuations with instability patterns are common phenomenon in the Colombo Stock Exchange (CSE), Sri Lanka. In the CSE context, very few studies have been focused and attempted to find out the new methodologies for forecasting stock price indices under the high volatility. The purpose of this study is to propose a new hybrid forecasting approach based on Geometric Brownian Motion to forecast stock market data under the unstable volatility.

The model selection criterion results of Akaike information criterion and Schwarz criterion suggested that, ARIMA (4, 1, 3) and ARIMA (1, 1, 1) approaches are suitable for predicting ASPI and SL20 price indices during the time period between 2010 January to 2016 December. Furthermore, the model accuracy testing results of mean absolute percentage error (MAPE) (GBM-ANN(0.024)<ARIMA (4,1,3)(0.124)) and Mean absolute deviation (MAD) (GBM-ANN(0.324)<ARIMA (4,1,3)(1.251)), suggested that new proposed GBM-ANN hybrid approach is the most suitable for forecasting price indices under the high volatility than traditional forecasting mechanisms.

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