

**FORECASTING STOCK PRICE INDEX IN SRI LANKA: A COMPARATIVE STUDY OF UNIVARIATE TIME SERIES MODELS**

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Construction of financial frameworks comprised of micro and macro-economic correlation factors are known to be a challenging task for researchers, and the importance of anticipating such financial changes in a country has driven the recent technologies to pursue better models, algorithms, and innovations. This study attempts to compare and contrast different statistical and soft computing methods by exploiting the volatility of All Share Price Index: Colombo Stock Exchanges' overall market movement index, by modelling and capturing the monthly closing market movement throughout the period from January 2000 to September 2019. The analysis is conducted with the application of Auto-Regressive Integrated Moving Average (ARIMA), Generalized Auto Regressive Conditional Heteroskedasticity (ARCH/GARCH), Stochastic Volatility (SV), Neural Network – Auto-Regressive (NNAR) models and Long Short-Term Memory (LSTM) models primarily focusing on the volatility of the stock market. Each utilized model is carefully crafted. Therefore, the selected models are best suited for the dataset according to a myriad of statistical tests. The concluded models were thereafter evaluated based on their predictive ability for the period from September to December, 2019 using Root Mean Square Error (RMSE), Mean Absolute Error (MAE), and Mean Absolute Percentage Error (MAPE) criteria. The results revealed the Neural Network methods utilized; NNAR and LSTM yielded better, consistent results and surpassed other models' performance by a higher degree. Yet the SV and ARCH/GARCH models managed to capture the volatility, whereas the conventional ARIMA models failed to do so. Coherent with the previous revelations, skewed and tailed conditional distributions served well for ARCH/GARCH modelling and depicted improved results. This study stands as evidence to stress with confidence that aged statistical tests perform poorly in the face of high volatilities, whereas SV models with high Markov Chain Monte Carlo (MCMC) iterations and soft computing methods yield exceptional results.

**Keywords:** Artificial Neural Network, Colombo Stock Exchange, Generalized Auto Regressive Conditional Heteroskedasticity, Long Short-Term Memory, Volatility