

**LONG SHORT-TERM MEMORY NETWORK TO PREDICT DAILY PLATTS
PRICE PER BARREL OF AUTO DIESEL**

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Auto diesel is one of the primary sources of energy consumed worldwide, and its price movements are subject to fluctuations in the global economy. Several studies have highlighted that fuel price prediction is challenging because the price fluctuation is dynamic, nonlinear and complex. This creates room for researchers to identify methods that predict price fluctuations accurately. The objective of the study is to forecast the daily Platts price per barrel of auto diesel using the Long Short-Term Memory (LSTM) network. The daily Platts price spans from January 2010 to March 2021 was collected from the Ceylon Petroleum Corporation of Sri Lanka. Firstly, descriptive statistics were obtained to explore the price fluctuations. Secondly, the LSTM approach was used to forecast daily Platts price as it is well-suited to capture long-term dependencies in time series data than conventional and standard recurrent neural network methods. Data were preprocessed to improve the model performance and then split into two for training (70%) and testing (30%) the model. The LSTM network was trained until convergence using the Adam optimisation algorithm, and the Mean Squared Error (MSE) was used as the loss function. Finally, prediction accuracy was evaluated using the Root MSE (RMSE), the Mean Absolute Error (MAE) and the Mean Absolute Percentage Error (MAPE). It is revealed that the daily prices oscillate significantly and deviate from a normal distribution. Moreover, the minimum and the maximum price per barrel were \$20.75 and \$144.37, respectively. The network convergence was attained after 40 epochs with a batch size of 60. Further, the forecast accuracy of LSTM was high, which was evident from RMSE (0.0125), MAE (0.0077) and MAPE (1.79%). Therefore, predictions from the LSTM network can be used to make better decisions to minimise the risk associated with price volatility.

Keywords: Auto diesel, Fluctuation, LSTM, Platts price