
Forecasting Inflation Rate in Sri Lanka Using Supervised Machine Learning Techniques

W.M.S. Bandara and W.A.R. De Mel

Department of Mathematics, Faculty of Science, University of Ruhuna, Sri Lanka

Corresponding author: ajith@maths.ruh.ac.lk

The general approach for forecasting is to use linear statistical methods such as ARIMA, ARCH, and GARCH models. Because of the availability of a large amount of historical inflation data, people need more advanced statistical techniques to accurately forecast the future behavior of the inflation rate which helps the economic development of a country. In this research, we used supervised machine learning models namely Random Forest regression, Lasso regression, Kernel Ridge regression, Bayesian Ridge regression, Support Vector Machine, and Elastic Net regression models for forecasting inflation rates in Sri Lanka. Monthly mean inflation data in Sri Lanka for 30 years from 1988 to 2018 were used in this study. In simulation studies, we divided the whole data set into two parts, namely, the training data set consisting of 358 data points and the test data set with the remaining 10 data points. All of the above models were trained by using the training data set and we used the k-fold cross-validation technique to estimate the parameters and hyperparameters of the models. All simulation studies were performed by using the GridSearchCV algorithm in Python programming. We also compared the model performances by using mean square error (MSE), root mean square error (RMSE), and mean absolute error (MAE) for the test data set. According to these performance measurements, we obtained the highest accuracy for the prediction of the inflation rate from the Support Vector regression model (RMSE-0.6261) and then Bayesian Ridge regression (RMSE-0.6263), Kernel Ridge regression (RMSE-0.6645), Lasso Regression (RMSE-0.7139), Elastic Net regression (RMSE-0.7396) and Random Forest regression (RMSE-8157) respectively.

Keywords: Cross-validation, Forecasting, Inflation, Machine learning, Regression