ABSTRACT

Hybrid autoregressive integrated moving average (ARIMA) and artificial neural networks (ANNs) ensemble is methodology which generating multi-model of hybrid ARIMA and ANNs then combining the output of each hybrid into single output. Meanwhile hybrid ARIMA and ANNs model is combination of ARIMA and ANNs which residual of ARIMA is used to input of ANNs. Hybrid ARIMA and ANNs ensemble are constructed to improve the performance of ARIMA for forecasting inflation in Indonesia. The architecture of ANNs in this research are feedforward neural network (FFNNs), recurrent neural network (RNNs), radial basis function neural network (RBFNNs) and generalized regression neural network (GRNNs) This research evaluates performance of hybrid ARIMA and ANNs ensemble based on root mean square error (RMSE), relative root mean square error (RelRMSE) and log mean square error ratio (LMR). This research use national inflation and seven cities in East Java as case study. The result show that, in the context of forecasting inflation, hybrid ARIMA and ANNs ensemble is better than ARIMA, particularly when the stacking hybrid ARIMA and GRNNs is used. Overall, stacking technique is better than averaging to combine ensemble member of hybrid ARIMA and ANNs.

Keywords: ANNs, ARIMA, FFNNs, GRNNs, Hybrid, Inflation, LMR, RBFNNs, RelRMSE, RMSE, RNNs