

Forecasting Electricity Spot Price with Generalized Long Memory Modeling: Wavelet and Neural Network

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Abstract : This aims of this paper is to forecast the electricity spot prices. First, we focus on modeling the conditional mean of the series so we adopt a generalized fractional k -factor Gegenbauer process (k -factor GARMA). Secondly, the residual from the k -factor GARMA model has used as a proxy for the conditional variance; these residuals were predicted using two different approaches. In the first approach, a local linear wavelet neural network model (LLWNN) has developed to predict the conditional variance using the Back Propagation learning algorithms. In the second approach, the Gegenbauer generalized autoregressive conditional heteroscedasticity process (G-GARCH) has adopted, and the parameters of the k -factor GARMA-GARCH model has estimated using the wavelet methodology based on the discrete wavelet packet transform (DWPT) approach. The empirical results have shown that the k -factor GARMA-G-GARCH model outperform the hybrid k -factor GARMA-LLWNN model, and find it is more appropriate for forecasts.

Keywords : electricity price, k -factor GARMA, LLWNN, G-GARCH, forecasting

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