

عنوان مقاله:

Improving the accuracy of financial time series prediction using nonlinear exponential autoregressive models

محل انتشار:

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خلاصه مقاله:

In recent years, precise analysis and prediction of financial time series data have received significant attention. While advanced linear models provide suitable predictions for short and medium-term periods, market studies have indicated that stock behavior adheres to nonlinear patterns and linear models capturing only a portion of the market's stock behavior. Nonlinear exponential autoregressive models have proven highly practical in solving financial problems. This article introduces a new nonlinear model that allocates coefficients to significant variables. To achieve this, existing exponential autoregressive models are analyzed, tests are conducted to validate data integrity and identify influential factors in data trends, and an appropriate model is determined. Subsequently, a novel coefficient allocation method for optimizing the nonlinear exponential Autoregressive model is proposed. The article then proves the ergodicity of the new model and determines its order using the Akaike Information Criterion (AIC). Model parameters are estimated using the nonlinear least squares method. To demonstrate the performance of the proposed model, numerical simulations of Kayson Corporation's stocks are analyzed using existing methods and the new approach. The numerical simulation results confirm the effectiveness and prediction accuracy of the proposed method compared to existing approaches.

کلمات کلیدی:

Financial time series, Nonlinear exponential autoregressive model, Prediction, Parameter estimation

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