

Wavelet Estimation of Functional Coefficient Regression Models

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The area of nonlinear time series models has experienced a great development since the 1980s. Although there is a wide range of parametric nonlinear time series models, in general we do not know if the postulated model is the most appropriated to a specific data set. This situation highlights the importance of nonparametric models. One of the interesting nonparametric models to fit nonlinear time series is the well known functional coefficient regression model. Nonparametric estimations by, e.g., kernels and splines, are developed in the literature. In this work we study the estimation of such model using wavelets. We will show the convergence rates of the proposed estimator and carry out a simulation study to evaluate which selection criteria (between AIC, AICc and BIC) is helpful to provide better resolution levels in order to minimize the mean square error. Moreover, we will use a real data set to make forecasts and to compare our method with others used in the literature.

Key Words: Nonlinear time series, father wavelets, Daubechies-Lagarias algorithm, resolution level.