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Extended Fuzzy Regression Model with Least Squares Estimation and Residual Evaluation

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Abstract

In this paper we extend the basic configuration of the fuzzy regression model so that boundaries of the membership function are less restricted, as well as the procedure of estimation for the fuzzy coefficient is also proposed. In addition, the residuals in the extended fuzzy regression model are evaluated by fuzzy arithmetic. The mean squared error defined in terms of the fuzzy residuals is used as a criterion for model selection. Finally the empirical study shows that the model selection procedure using MSE can provide an objective decision in the analysis of Taiwan's Monitoring Indicator.

Keywords: Extended fuzzy regression model (EFR model), fuzzy coefficient, least squares method, fuzzy residuals, mean squared error (MSE).