Dimension Reduction in Time Series Regression Model

Shao-Ting Lo, Chao-Zhang Huang, and Rouh-Jane Chou
National Tsing Hua University, Hsinchu, Taiwan

The sliced inverse regression (SIR) is proposed by Li (1991) as a method for reducing the dimension of the regressors space. This method requires that the observations be independent. Becker et al. (2000) extended this method to the problem when both response and explanatory variables are time series. The dynamical sliced inverse regression (DSIR) method used as regressors not only the explanatory variables themselves but also their lagged series. However, simulation studies showed that the efficiency was poor even when the effective dimension was as low as three. In this article, we offer a modified method which resolves the difficulty. The efficiency of the modified procedure is investigated. Its performance is demonstrated by simulation studies.

[Shao-Ting Lo, Institute of Statistics, National Tsing Hua University, Hsinchu, 30013 Taiwan.; d927002@oz.nthu.edu.tw]