

Consistent estimation of the dimensionality in sliced inverse regression

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Abstract Several methods have been proposed in the literature in order to estimate the dimensionality in sliced inverse regression. Most of these methods are based on sequential tests for the nullity of the last eigenvalues of suitable operators. We first establish non consistency for estimators resulting from these methods. Then, we propose an estimator obtained by minimizing a suitable penalization of a statistic based on eigenvalues. A consistency property is established for this estimator and a simulation study is undertaken to evaluate its finite sample performance.

Keywords Consistency · Dimensionality · Estimation · Sliced inverse regression