Abstract

In regression analysis, it is frequently required to transform the dependent variable in order to obtain additivity and normal errors with constant variance. Box and Cox (1964) proposed a parametric power transformation based on the assumption of normality with the aim to achieve these goals. However, some authors such as Carroll (1980, 1982b), Bickel and Doksum (1981), Powell (1991), Chamberlain (1994), Buchinsky (1995), Marazzi and Yohai (2004) and Fitzenberger et al. (2005) have pointed out that this transformation is not robust to the presence of outliers, and propose robust estimators for the transformation parameter by replacing the normal likelihood with an objective function that is less sensitive to them. This paper presents a non-parametric alternative procedure for obtaining a power transformation within the Box-Cox family which is robust to the presence of outliers in the dependent variable. The procedure is an extension of the one proposed by Castaño (1994, 1995) for a symmetry transformation of a dataset.

Keywords

Box-Cox transformation, robust estimator, non-parametric estimator, outliers.