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Title : Estimation of Conditional Ranks and Tests of Exogeneity in Nonparametric Nonseparable Models (joint with Jean-Pierre Florens & Frédérique Fève.)

Abstract : Consider a nonparametric nonseparable regression model $Y=g(Z,U)$, where $g(Z,U)$ is increasing in U , and U is $U[0,1]$. We suppose that there exists an instrument W that is independent of U . The observable random variables are Y , Z and W , all one-dimensional. The purpose of this paper is twofold. First, we study the asymptotic properties of a kernel estimator of the distribution of $V = F_{\{Y|Z\}}(Y|Z)$, which equals U when Z is exogenous. We show that this estimator converges to the uniform distribution at faster rate than the parametric $n^{-1/2}$ -rate. Next, we construct test statistics for the hypothesis that Z is exogenous. The test statistics are based on the observation that Z is exogenous if and only if V is independent of W , and hence they do not require the estimation of the function g . The asymptotic properties of the proposed tests are proved, and a bootstrap approximation of the critical values of the tests is shown to work for finite samples via simulations. An empirical example using the U.K. Family Expenditure Survey is also given.