ESTIMATION OF STRUCTURAL PARAMETERS IN LINEAR-NONLINEAR MODELS IN THE PRESENCE OF MISSING OBSERVATIONS

by

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ABSTRACT

Efficient estimation of structural parameters in linear/nonlinear models is done by considering the missing observations as unknown nuisance parameters and hence eliminated. The elimination procedure made use of an extension of Pfanzagl's path analytic approach of effectively separating the information for the structural and nuisance parameters. Estimation is done for each missing data pattern by constructing efficient asymptotically linear estimators (EALE's) which achieve a version of van der Vaart's local asymptotic minimax (LAM) bound on the risk of estimators. For each component of the structural parameter, the efficient estimator is arrived at by optimally combining the EALE's for each missing data pattern.

The nonlinear case is treated as an extension of the estimation procedure in the linear case by using a separability notion on the functional form of the nonlinear model. For the two classes of models, it is assumed that the error density belongs to a location and scale family. The missing observations are assumed to be governed by a specific missing data mechanism. The missing data mechanism is such that for each missing pattern, a unique threshold value exists which causes the observations to be unobserved. The threshold values affect the observations if they are generated within a decreasing neighborhood from it.