ESTIMATION OF A STRUCTURAL LINEAR REGRESSION MODEL WITH A KNOWN RELIABILITY RATIO

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Abstract. In this paper, we consider the estimation of the slope parameter β of a simple structural linear regression model when the reliability ratio (Fuller (1987), *Measurement Error Models*, Wiley, New York) is considered to be known. By making use of an orthogonal transformation of the unknown parameters, the maximum likelihood estimator of β and its asymptotic distribution are derived. Likelihood ratio statistics based on the profile and on the conditional profile likelihoods are proposed. An exact marginal posterior distribution of β, which is shown to be a t-distribution is obtained. Results of a small Monte Carlo study are also reported.

Key words and phrases: Orthogonality, profile likelihood, measurement error model, conditional model, likelihood ratio statistic, marginal posterior distribution.