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Indirect Inference with Endogenously Missing Exogenous Variables

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Abstract

We consider consistent estimation of parameters in a structural model by Indirect Inference (II) when the exogenous variables can be missing at random (MAR) endogenously. We demonstrate that II procedures that simply discard sample units with missing observations can yield inconsistent estimates of the true structural parameters. By inverse probability weighting (IPW) the "complete case" observations, i.e., sample units with no missing variables for the observed and simulated samples, we propose a new method of II to consistently estimate the structural parameters of interest. Asymptotic properties of the new estimator are discussed. We consider a multinomial probit model to illustrate this approach and subsequently consider simulation studies in a variety of discrete choice models with and without dynamics in terms of lagged dependent variables and serially correlated errors. The simulation results demonstrate the severe bias incurred by existing II estimators, and its correction by our new II estimator.

Keywords: Indirect Inference; Missing at Random; Inverse Probability Weighting; Discrete Choice Models.

JEL Code: C13; C15; C18.

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