Estimation Methods for Mixed Regressive, Spatial Autoregressive Models with Randomly Missing Observations in Dependent Variables (Preliminary)

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Abstract

This paper compares different methods for the estimation of mixed regressive, spatial autoregressive (MRSAR) models with randomly missing observations in dependent variables. In addition to the traditional EM algorithm and imputation method, we suggest a nonlinear least squares and develop a generalized method of moments (GMM) estimation based on linear moments to estimate the model. We compare these estimation methods and find that when the disturbances are *i.i.d.*, the generalized nonlinear least squares (NLS), the generalized two stage least squares (2SLS) with imputation and the best GMM we suggest have identical asymptotic distributions. While comparing with the maximum likelihood (ML) estimation with imputation and the EM algorithm, these methods are less efficient. However, when heteroskedasticity exists, the EM algorithm and the ML estimation with imputation will produce inconsistent estimators. Under this situation, the former three methods outperform the latter two. Monte Carlo experiments provide finite sample evidence of our theory.

Key Words: Spatial Autoregressive Models, Missing Data, Dependent Variables, Estimation Methods

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