

SPATIAL MULTIVARIATE REGRESSIONS WITH PANEL DATA

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In this study we developed an estimator capable of simultaneously handling with a spatial multivariate regression model and a panel data structure. We derived our estimator based on the Bayesian approach that has important advantages in terms of the ability to obtain reliable estimates in the context of small samples and high-dimensional parameter space. This work extends the previous study undertaken by Gamerman and Moreira (2004) conjugating cross-section data and time series (Hsiao, 1995; Baltagi, 1995; Arellano, 2003). The here introduced longitudinal data analysis allows to analyze not only the case of the fixed effect but also the random effect model.

The introduction of a panel data structure presents some difficulties, mainly in the case of the random effect model (Laird and Ware, 1982). The specification we follow to model the random effect is known in a classical econometric literature as error components model (Baltagi, 1995). The method applied to estimate the random effects model can be seen as an extension of that which appears in Greenberg (2007) to treat univariate case. Here, we employ the hierarchical analysis also used to estimate some categories of models with longitudinal data. This approach separates the parameters in groups facilitating the computation that is carried out by the method of Monte Carlo Markov chain (MCMC). The Monte Carlo simulations through Markov chain demonstrated the efficient ability of this estimator to replicate the simulated data.

EXECUTIVE SUMMARY