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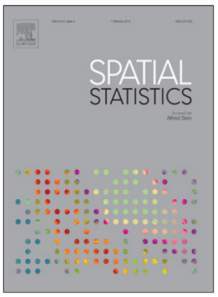

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Statistical inference for partially linear additive spatial autoregressive models

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Abstract In this paper, a class of partially linear additive spatial autoregressive models (PLASARM) is studied. With the nonparametric functions approximated by basis functions, we propose a generalized method of moments estimator for PLASARM. Under mild conditions, we obtain the asymptotic normality for the finite parametric vector and the optimal convergence rate for nonparametric fucntions. In order to make statistical inference for parametric component, we propose the estimator for asymptotic covariance matrix of the parameter estimator and establish the asymptotic properties for the resulting estimators. Finite sample performance of the proposed method is assessed by Monte Carlo simulation studies, and the developed methodology is illustrated by an analysis of the Boston housing price data.

Keywords Spatial autoregressive models; partially linear additive model; instrument variable
MR(2000) Subject Classification 62G08, 62G20

1 Introduction

In recent years, semiparametric models have received a lot of attention in literature of both statistics and econometrics due to their explanatory power of parametric modeling and flexibility of nonparamtric modeling. Among the various semiparametric regression models, the most popular one is perhaps the partially linear additive model (PLAM), in which the response variable depends on some independent variables in a linear way but is nonlinearly related to the remaining independent variables. Therefore, PLAM provides good balance between interpretation of the classical linear model and flexibility of the nonparametric additive model. There are great interests in estimation and statistical inference for PLAM. Liu et al. (2011) proposed

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