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# Spatial Weights Matrix Selection and Model Averaging for Spatial Autoregressive Models\*

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## Abstract

Spatial econometrics relies on the spatial weights matrix to specify the cross-sectional dependence; however, the candidate spatial weights matrices might not be unique. This paper proposes a model selection procedure to choose a weights matrix from several candidates by using a Mallows type criterion. We prove that when the true weights matrix is not in the candidates, the procedure is asymptotically optimal in the sense of minimizing the squared loss; otherwise, the procedure can select the true weights matrix consistently. We then propose a model averaging procedure to reduce the squared loss. We also provide procedures for the spatial model with heteroscedasticity and endogenous regressors and the model with both spatial lag and spatial error. Monte Carlo experiments show that proposed procedures have satisfactory finite sample performances. We apply the model selection and model averaging procedures to study the market integration in China using historical rice prices.

*JEL classification:* C13; C21; C52

*Keywords:* Model Averaging, Model Selection, Spatial Autoregressive, Spatial Econometrics

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