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Editorial introduction to the special issue entitled: Spatial econometrics: New methods and applications

Spatial econometrics is a fast growing research area, with the theories and methods developed over the past five decades or so being applied more and more widely, not only in the specialized fields such as regional science, real estate, economic geography, and urban economics, but also increasingly in the general fields such as economics, finance and social networks, in particular in the recent decade. One of the driving forces is perhaps the formation of the *Spatial Econometrics Association* (SEA) at Rome in 2006 and its subsequent annul conference started in 2007 at the Cambridge University, which have helped greatly the development and the dissemination of the spatial econometrics methods. The *XI World Conference of the Spatial Econometrics Association*, held in Singapore in June 2017, particularly witnessed such a success, due to the strong support of the world leading experts: Peter Robinson, Lung-Fei Lee and Jushan Bai as Keynote speakers, and Badi Baltagi, Ingmar Prucha, Anil Bera, Giuseppe Arbia, Paul Elhorst, and Jesus Mur as invited speakers.

With the kind agreement of the Editors of the *Regional Science and Urban Economics*, a special issue was dedicated to the SEA2017. It contains some of the papers presented at the conference, of which all have gone through full reviews according to the standard practice of the journal. The authors of these papers are the leading experts in spatial econometrics and applications. As the guest editor I would like to take this opportunity to thank the authors and referees for their contributions to this special issue that should no doubt be beneficial to both theoretical and applied researchers.

The ten papers included in this special issue represent a nice blend of spatial econometric theories, methods and applications. First, **Xu and Lee** present a review on the theoretical foundations with spatial econometric research. They discuss how spatial econometric models can be regarded as the Nash equilibrium of some complete information games, which gives the theoretical economics foundation for spatial econometric model specifications. They argue that many spatial tests and estimation methods for the linear spatial models depend on the linear-quadratic forms, which can be characterized by the sum of martingale differences (MD) so that the central limit theorems for MD arrays can be used to established the asymptotic normality of the statistics. Furthermore, using the spatial Tobit and binary choice models, they illustrate the importance of the concepts and properties of the near-epoch dependent random fields in studying the nonlinear spatial models.

Baltagi, Fingleton and Pirotte consider a spatial dynamic panel data model with spatial moving average disturbance that includes individual specific random effects and remainder errors. They study the estimation and prediction problems based on a four-stage generalized moments approach, which are then illustrated using the data on employment levels across 255 NUTS regions of the EU over the period 2001–2012. **Yang and Lee** study the identification and estimation of spatial dynamic panel simultaneous equations models, based on quasi-maximum likelihood estimators with large n and T and IV-based estimators with large or small T. **Bera, Doğan, Taşpinar and Leiluo** introduce adjusted LM tests for spatial dynamic panel data models with fixed effects when there is a local misspecification under the alternative model. As discussed in **Arbia, Ghiringhelli and Mira**, spatial econometrics is currently experiencing the Big Data revolution both in terms of the volume of data and the velocity with which they are accumulated. They carry out a systematic simulation study on the limits of the current methodologies when estimating spatial models with large datasets. The paper by **Santos and Proença** tackles the computation issues in the estimation of nonlinear spatial models. They present a new method to approximate the inverse of the spatial lag operator, used in the estimation of spatial lag models for binary dependent variables, which is especially useful for the case where the spatial weighting matrix is large and dense. An interesting application of the spatial binary choice model is seen in **Calabrese, McCollum and Pace** for mortgage default decisions that incorporates neighborhood effects in the disturbances, based on a large dataset on almost 300,000 mortgages in Clark County, which includes Las Vegas, over 2009–2010. **Kosfeld and Dreger** specify a spatial error correction model to exam the relevance of spatial effects in wage curve in East German based on a global panel cointegration approach. **Kesina, Baltagi and Egger** employ a bivariate spatial probit model to study the contagion and spillovers effects in exporting and in foreign ownership decisions, using data on 8959 firms located in Shanghai. **Guo and Qu** close up this special issue with an article on "spatial interactive effects on housing prices in Shanghai and Beijing". They build a spatial autoregressive hedonic pricing model in a system of interrelated networks, which allows for multiple spatial interactive effects among housing units inside the same city and from other cities. They estimate the model using the 2SLS and MLE methods.

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