YUFAN LEILUO

Department of Economics, University of Illinois at Urbana-Champaign
Phone: 217-721-0319, Email: leiluo2@illinois.edu

EDUCATION

Ph.D. Economics, University of Illinois at Urbana-Champaign, expected May 2020
M.S. Policy Economics, University of Illinois at Urbana-Champaign, 2015
B.S. Mechanical Engineering, Peking University, China, 2013
B.S. Economics, Peking University, China, 2013

FIELDS OF CONCENTRATION

Econometrics, Spatial Analysis, Applied Econometrics

TECHNICAL STRENGTHS

R (advanced), Latex (advanced), Python (basic), C (basic), Matlab (basic)

RESEARCH PROJECTS

Job Market Paper:
"Robust LM Tests for Spatial Dynamic Panel Data Models under both Parametric and Distributional Misspecifications"
Published Paper:
"Robust LM tests for spatial dynamic panel data models", with Anil Bera, Osman Dogan and Suleyman Taspinar
Working Paper:
"Robust LM Tests for Spatial Dynamic Panel Data Models: The sdpdlm R Package", with Anil Bera, Osman Dogan and SUleyman Taspinar
"Nested and Non-nested Tests of Nonlinear Spatial Volatility Model with Distributional and Parametric Misspecifications", with Anil Bera
"A Spatial Geographically Weighted Panel Approach to Estimating Growth Models", with Guzin Bayar and Bulent Guloglu
"A Spatial Binary Panel Analysis of Growth Accelerations", with Guzin Bayar and Bulent Guloglu

CONFERENCE PRESENTATIONS

Midwest Econometrics Group, University of Wisconsin–Madison, 2018
Applied Economics, Regional, and Urban Studies, University of Illinois at Urbana-Champaign, 2019
Midwest Econometrics Group, Ohio State University, 2019
Spatial Econometrics Association, Pittsburgh, 2019

TEACHING EXPERIENCE

Weekly Teaching as TA:
Economic Statistics II, University of Illinois at Urbana-Champaign, Fall 2019.
Office Hours and Grader:
Industrial Competition and Monopoly, University of Illinois at Urbana-Champaign, Spring 2016, 2017.
Economics of Coordination, University of Illinois at Urbana-Champaign, Spring 2016, 2017.
Grader:
Middle-Eastern Economics, Spring 2018.
Introduction to Game Theory, Fall 2016 Economic Forecasting, Spring 2019
Econometrics of Policy Evaluation, Spring 2018.

AWARDS AND FELLOWSHIP

Travel Grant, Department of Economics, University of Illinois at Urbana-Champaign 2018, 2019
Summer Research Fellowship, Department of Economics, University of Illinois at Urbana-Champaign, 2016, 2017

PERSONAL INFORMATION

Citizenship: China
Language: English (fluent), Chinese (native)

REFERENCES

Professor Anil Bera,
Department of Economics, University of Illinois at Urbana-Champaign,
Phone: 217- 333-4596 Email: abera@illinois.edu

Professor Ji Hyung Lee,
Department of Economics, University of Illinois at Urbana-Champaign,
Phone: 217- 300-3450 Email: jihyung@illinois.edu

Professor Eun Yi Chung,
Department of Economics, University of Illinois at Urbana-Champaign,
Email: eunyi@illinois.edu

Professor Xiaofeng Shao,
Department of Statistics, University of Illinois at Urbana-Champaign,
Email: xshao@illinois.edu

ABSTRACTS

"Robust LM Tests for Spatial Dynamic Panel Data Models under both Parametric and Distributional Misspecifications"

In this paper, I introduce Rao's score test statistics (Lagrange multiplier (LM) tests) for a spatial dynamic panel data (SDPD) model which includes a contemporaneous spatial lag, a time lag and a spatial-time lag. The tests are robust to both parametric and distributional misspecifications, and can be used to test the significance of each of the three lag terms. It can also test any combination of them jointly. The quasi maximum likelihood estimator (QMLE) for the SDPD models suffers from an incidental parameter problem due to the individual and time fixed effects in the model. The score functions then can have asymptotic bias, and are not centered on zero. This paper shows how to make correction to the score functions, so they are centered at 0 using both transformation approach and direct approach for estimation of the model. Then, I derive LM test statistics that are valid under distributional misspecification, and LM tests that are robust to local parametric misspecification. Finally, the two derived tests are combined to construct new LM tests, which are robust to both parametric and distributional misspecifications. I illustrate the performance of the suggested test in a Monte Carlo study and empirical applications.

"Robust LM tests for spatial dynamic panel data models""

In this study, we introduce adjusted Rao's score test statistics (Lagrange multiplier (LM) tests) for a spatial dynamic panel data (SDPD) model that includes a contemporaneous spatial lag, a time lag and a spatial-time lag. The maximum likelihood estimator for the estimation of SDPD models can have asymptotic bias because of individual and time fixed effects. Bias arises since the limiting distributions of the score functions derived from the corresponding concentrated log-likelihood functions are not centered on zero. First, we show how the score functions should be adjusted to avoid the effect of asymptotic bias on the standard

LM test statistics. Second, we further adjust score functions such that the resulting LM test statistics are valid when there is local parametric misspecification in the alternative model. Our adjusted LM test statistics can be used to test the presence of the contemporaneous spatial lag, time lag and spatial-time lag in an SDPD model. In a Monte Carlo study, we demonstrate that our suggested test statistics have good finite sample size and power properties. Finally, we illustrate implementation of these tests in an application on public capital productivity in 48 contiguous US states.

"Robust LM Tests for Spatial Dynamic Panel Data Models: The sdpdlm R Package"

In this article, we present the R package sdpdlm for testing various effects in spatial dynamic panel data (SDPD) models. The package implements Rao's score statistics or Lagrange multiplies (LM) tests based on the general method suggested in Bera, Dogan, Taspinar, and Leiluo (2018c) for some well-known SDPD specifications. The package includes several marginal LM tests as well as several joint tests for testing the presence of spatial and time lag effects in the SDPD models. We provide some simulation evidence on the finite sample properties of these test statistics. We also illustrate the implementation of these test statistics by using the well-known panel data set on capital productivity from Munnell (1990).

"Nested and Non-nested Tests of Nonlinear Spatial Volatility Model with Distributional and Parametric Misspecifications'

Almost all the specifications for spatial model deal with the conditional mean (conditional on the neighborhood structure) of the variable of interest through models such as the spatial autoregressive model (SAR) and its extensions. In this paper, we consider the conditional variance. We first propose a nonlinear SAR conditional heteroskedasticity (NSARCH) model and discuss its properties and empirical relevance. The added nonlinearity is introduced through the Box-Cox (BC) transformation. This model encompasses the linear and log linear form with BC parameter being 1 and 0, respectively. First, we derive various combinations of Rao's score (RS) tests for testing linear or log linear functional form and the presence of spatial correlation, in their original and robust forms, assuming normality. Then we relax that assumption and further robustify the tests under distributional misspecification. We explore the formulation of these tests after estimating the model using generalized method of moments (GMM), instead of by maximum likelihood estimator (MLE) or quasi MLE (QMLE). We also develop non-nested tests for linear vs. log linear forms and vice-versa for selecting one of the models which may be of practical interest. Moreover, we explore the use of bootstrap procedures instead of using the tabulated asymptotic critical values for conducting the tests. The finite sample performance of the proposed tests is investigated by an extensive Monte Carlo simulation study. Finally, we illustrate the usefulness of our suggested test procedures by a substantive empirical application.

"A Spatial Geographically Weighted Panel Approach to Estimating Growth Models"

In this study, using panel data of OECD countries for 1980-2014; we estimated GDPPC using geographically weighted regression (GWR). GWR is a generalized version of locally weighted regression, an application of it to spatial data. It allows coefficients of the regression vary for each geographical unit. Panel data applications of it is relatively new and there are few studies in the literature. In al these models, weight matrices are time invariant. There are yet no studies extending GWR estimation to time varying weight matrices. In this article, we offer an approach for estimation of such models. For this purpose, we combine the method developed by Mundlak (1978) and Chamberlain (1984) for estimation of unobserved effects with GWR estimation methods.

"A Spatial Binary Panel Analysis of Growth Accelerations"

Aim of this study is to examine growth experience of countries from the perspective of growth accelerations. Growth accelerations models used by the economists began to be extended by spatial variables, both geographical and social; especially in the last decade. We estimate a growth acceleration regression of

82 developed and developing countries for the period 1970-2014; extending binary spatial panel estimation techniques. Panel data estimation of spatial binary models are relatively new. We offer a new estimation approach to the case where weight matrix varies among time; extending standard spatial binary data estimation techniques to combine them with Mundlak (1978) and Chamberlain (1984) approaches in estimation of panel unobserved effects. The estimation method we offer enables us to estimate both unobserved effects and coefficients of a spatial binary model with time varying weight matrix consistently. Results suggest that the countries that are closer in terms of their position in economic globalization index are affected more from each other in comparison to the effect they get from their geographical neighbors.