Short Course: Spatial econometrics - theory and applications

Michaela Kesina, University of Groningen

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Background

Networks and interdependence are important in many economic contexts. In numerous empirical applications, cross-sectional units - individuals, firms, countries, or municipalities - interact in an interdependent way. Popular examples are the price setting behavior of firms, tax competition or public expenditures of municipalities. In an interdependent world, shocks of one unit are transmitted to other units. Popular examples are labor market shocks or the spread of a virus. To investigate the aforementioned examples empirically, interdependence needs to be formalized. And this is done with models in spatial econometrics.

Aim, overview, and learning objectives

The aim of this short course is to give an introduction to spatial econometrics and to provide an overview how to estimate some popular spatial econometric models. We discuss different forms of spatial correlation, e.g. in the dependent variable, the regressors, and the errors. These lead to different models and estimation approaches, which we will cover in the course. We will also discuss specification tests, goodness of fit measures, and the calculation of marginal effects.

The course consists of a theoretical and a practical part. In the theoretical part, models, estimation approaches, and tests are presented and discussed. In the practical part, the concepts are applied using real-world data.

By the end of the course, students should be aware of the different estimation approaches, their applicability, and their advantages and disadvantages. Furthermore, they should be able to use the estimators in practice to conduct their own research.

Course organization

For the theoretical part, I will prepare slides, which will be discussed in class. For the applied part, I will provide STATA do files, log files, and data sets. Students will practice the application of the different estimation approaches under my supervision in the computer room.

Course assessment

The course grade will be determined based on an own empirical short paper handed in until the end of the semester.

Course topics

1. Introduction
2. Spatial weight matrix
3. Testing for spatial correlation
4. Estimation of models with spatial correlation in the dependent variable
5. Estimation of models with spatial correlation in the error
6. Estimation of models with spatial correlation in the regressors
7. Estimation of models with multiple forms of spatial correlation

Literature

LeSage, J.P., and Pace, R.K. (2009). *Introduction to Spatial Econometrics.* Boca Raton: CRC Press.

Kelejian, H. and Piras, G. (2017). *Spatial Econometrics.* London: Academic Press.

Arbia, G., Espa, G., and Giuliani, D. (2021). *Spatial Microeconometrics.* Abingdon: Routledge.

Contact details lecturer

The course is taught by Michaela Kesina, who can be reached at m.kesina@rug.nl.