Thematic Course – PhD in
"Scienze Economiche e Statistiche" / "Economics, Business and Statistics"
Department of "Scienze Economiche, Aziendali e Statistiche"
Università di Palermo

Academic Year	2023-2024
Subject	Cross-sectional and panel data spatial models with R
Instructor	Gianfranco Piras
Course description	The course will cover basic cross-sectional spatial models. In particular, we will discuss estimation using generalized least square (GLS), feasible GLS (FGLS), Maximum Likelihood (ML), and generalized methods of moments (GMM) estimators. The focus will be mainly on models including a spatial lag of the dependent variable whose interpretation requires appropriate measure of impacts. Particular attention will be devoted to alternative methods to approach statistical inference of these impacts. An overview of basic models for spatial panel data will also be discussed. All of the examples will be demonstrated using the R statical software. Specifically, we will make use of three R packages namely **spdep**, **spatialreg**, **sphet** and **splm**.
Learning Objectives	Specify, estimate and interpret spatial cross-sectional as well as spatial panel data models.
Suggested readings	Kelejian H. and Piras G "Spatial Econometrics", Elsevier, Academic Press (Chapters 1, 2, 3, and 15). Piras G. and Postiglione P. "A deeper look at impacts in spatial Durbin model with sphet", Geographical Analysis, (2022) 54(3), 664-684. Bivand R. and Piras G. "Comparing implementation of estimation methods for Spatial Econometrics, Journal of Statistical Software (2015), 63(18), 1-36. Millo G. and Piras G. "splm: spatial panel data models in R", Journal of Statistical Software (2012), 47(1), 1-38. Piras G., "sphet: Spatial models with heteroskedastic innovations in R" Journal of Statistical Software (2010), 35(1), 1-21.
Course Activity (hrs)	6
Credits	1
Assessment Method	Final test
Teaching Methods	Lectures and labs on computers
Calendar	July 17-18, 2023
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