Graduate econometrics III

Lecturer
David PREINERSTORFER (Coordinator)

Course mnemonic
ECON-S521

ECTS credits
5 credits

Language(s) of instruction
English

Course period
Second term

Campus
Solbosch

Course content

Special interests of participating students can be taken into consideration (if they broadly fit into the framework below); suggestions are welcome and will be discussed in the first lecture.

To give an example, the topics of the lecture could contain (the first item constituting the core component, other topics will be selected in the first lecture):

1. Revision of hypothesis testing, confidence interval construction, and related optimality concepts.
2. (Non-) Testability of hypotheses (Bahadur-Savage-type results)
3. Identification in econometrics.
4. Impossibility results when parameters can be nearly non-identified (applications to testing under weak instruments, unit root testing, spectral density estimation, and testing for long-range-dependence).
5. Uniform vs. non-uniform asymptotic approximations with a special emphasis on autocorrelation robust testing, model selection, and the zero power trap in testing for spatial or temporal autocorrelation.
6. Impossibility results in high-dimensional testing problems.

Objectives (and/or specific learning outcomes)

Successful completion of this course should enable students to understand parts of the current literature on non-standard inference problems in econometrics and to make their own contributions to this literature. Depending on the topics covered, students understand, e.g., the consequences of identification failure for econometric inference, the problems associated with asymptotic results that fail to be uniform in the parameters, or difficulties arising in high-dimensional testing problems. Students know how to conduct Monte Carlo studies to evaluate properties of tests and confidence intervals, and are aware of the practical consequences of the topics discussed.

Pre-requisits and co-requisits

Required knowledge and skills

An equivalent of the content of ECON-S-428 (Graduate Econometrics I)

Teaching method and learning activities

The course consists of (i) lectures in which the topics are discussed by the instructor and (ii) lectures where students discuss/present solutions to exercises and their final project.

Contribution to the teaching profile

This course introduces participants to selected advanced topics in econometrics. The first part of the course develops necessary terminology concerning hypothesis testing, confidence intervals, and related optimality concepts used in econometrics. Then, depending on the interests of the participants, we discuss topics such as the ones mentioned in `` Contents of the teaching unit'' further below.

References, bibliography and recommended reading

A selective list:

Andrews, D. W., M. J. Moreira, and J. H. Stock (2007). Performance of conditional Wald tests in IV regression with weak instruments. *Journal of Econometrics* 139 (1), 116-132.

Andrews, I. (2016). Conditional linear combination tests for weakly identi_ed models. *Econometrica* 84 (6), 2155-2182.

Andrews, I. and A. Mikusheva (2016). Conditional inference with a functional nuisance parameter. *Econometrica* 84 (4), 1571-1612.

Bahadur, R. R., & Savage, L. J. (1956). The nonexistence of certain statistical procedures in nonparametric problems. *Annals of Mathematical Statistics*, *27*(4), 1115-1122.

Berk, R., Brown, L., Buja, A., Zhang, K., & Zhao, L. (2013). Valid post-selection inference. *Annals of Statistics*, *41*(2), 802-837.

Den Haan, W. J., & Levin, A. T. (1997). 12 A practitioner's guide to robust covariance matrix estimation. *Handbook of Statistics*, *15*, 299-342.

Dufour, J. M. (1997). Some impossibility theorems in econometrics with applications to structural and dynamic models. *Econometrica*, 1365-1387.

Elliott, G., U. K. Müller, and M. W. Watson (2015). Nearly optimal tests when a nuisance parameter is present under the null hypothesis. *Econometrica* 83 (2), 771-811.

Imbens, G. W., & Manski, C. F. (2004). Confidence intervals for partially identified parameters. *Econometrica*, *72*(6), 1845-1857.

Kiefer, N. M., Vogelsang, T. J., & Bunzel, H. (2000). Simple robust testing of regression hypotheses. *Econometrica*, *68*(3), 695-714.

Leeb, H., & Pötscher, B. M. (2005). Model selection and inference: Facts and fiction. *Econometric Theory*, *21*(01), 21-59.

Lehmann, E. L., & Romano, J. P. (2006). *Testing statistical hypotheses*. Springer.

Pötscher, B. M. (2002). Lower risk bounds and properties of confidence sets for ill#posed estimation problems with applications to spectral density and persistence estimation, unit roots, and estimation of long memory parameters. *Econometrica*, *70*(3), 1035-1065.

Preinerstorfer, D., & Pötscher, B. M. (2016). On size and power of heteroskedasticity and autocorrelation robust tests. *Econometric Theory*, *32*(02), 261-358.

Preinerstorfer, D., & Pötscher, B. M. (2017) On the power of invariant tests for hypotheses on a covariance matrix. *Econometric Theory*, *33*(1).

Romano, J. P. (2004). On non#parametric testing, the uniform behavior of the t#test, and related problems. *Scandinavian Journal of Statistics*, *31*(4), 567-584.

Course notes

Université virtuelle and Podcast

Other information

Place(s) of teaching

Solbosch

Contact(s)

David Preinerstorfer
ECARES, Université libre de Bruxelles
Office: 42 Ave. F.D. Roosevelt, R42.5.223
E-Mail: david.preinerstorfer(at)ulb.ac.be
Phone: +32 2 650 3366

Evaluation method(s)

Other

Evaluation method(s) (additional information)

Grading is based on (i) assignments (theoretical as well as computational; performance concerning the assignments is measured in terms of the quality/frequency of presentations) and (ii) a final project and its presentation.

Determination of the mark (including the weighting of partial marks)

Both of the two grading components carry equal weight.

Main language(s) of evaluation

English

Programmes

Programmes proposing this course at the Solvay Brussels School of Economics and Management

MA-ECOE | Master in Economics : Econometrics | finalité Research in Economics/unit 2 and finalité Research in Economics and statistics/ unit 2

Programmes proposing this course at the faculty of Sciences

MA-STAT | Master in Statistics : General | finalité Research General/ unit 2