



ECONOMETRICS RESEARCH SEMINAR

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- HSII (lecture room II, groundfloor)
Institut für Höhere Studien
Stumpergasse 56, 1060 Wien

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“Detecting changes in the mean of functional observations”

ABSTRACT

Principal component analysis has become a fundamental tool of functional data analysis. It represents the functional data as $X_i(t) = \mu(t) + \sum_{1 \leq j < \infty} \eta_{i,j} v_j(t)$, where μ is the common mean, v_j are the eigenfunctions of the covariance operator and the $\eta_{i,j}$ are the scores. Inferential procedures assume that the mean function $\mu(t)$ is the same for all values of i . If, in fact, the observations do not come from one population, but rather their mean changes at some point(s), the results of principal component analysis are confounded by the change(s). It is therefore important to develop a methodology to test the assumption of a common functional mean. We develop such a test using quantities which can be readily computed in the R package `fda`. The null distribution of the test statistic is asymptotically pivotal with a well-known asymptotic distribution. The asymptotic test has excellent finite sample performance. Its application is illustrated on temperature data from England.

with Robertas Gabrys (Utah State University, Logan), Lajos Horváth (University of Utah, Salt Lake City), and Piotr Kokoszka (Utah State University, Logan).