Investigating the term structure of government bond yields: A co-integration analysis

February 3, 2017, 14h30, ISCTE-IUL, Auditorium ONE2 (Building I)

Luca De Angelis
University of Bologna

Luca De Angelis is currently assistant professor of econometrics at the Department of Statistical Sciences of the University of Bologna. Luca’s work is mainly focused on financial econometrics and time series analysis, with a particular attention to non-stationarity and co-integration, but also worked extensively on other topics like dynamic latent variable models and regime-switching. He has lectured the course “Applied Econometrics” since 2011 and he is currently the Director of the 2nd level University Professional Master’s Programme in Quantitative Risk Management.

[Abstract]: The aim of the paper is to investigate the term structure of monthly US government bond yields. Term structure models describe the shape of the yield curve and its evolution over time. It is generally convenient to reduce the dimension of the modeling problem by relating the yield curve dynamics to a small number of common factors. A main reference in this context is the Dynamic Nelson-Siegel (DNS) model, which imposes a particular parametric form on the loading of three factors. Depending on the stationary or unit root properties of these factors, the model implies a Co-integrated Vector AutoRegression (CVAR) for a vector of yields. Therefore, in this paper we investigate whether the co-integration restrictions implied by the DNS model are supported by an empirical CVAR model. A particular attention is paid to the fact that the interest rate volatility has changed considerably over time. This issue is faced using recently developed co-integration methods which are robust to heteroskedasticity such as likelihood ratio tests based on the wild bootstrap and information criteria.

In particular, we advocate the use of information criteria-based methods which allow to determine not only the co-integration rank, but also the (unknown) autoregressive lag length of the CVAR model. Using asymptotic and finite sample properties of different methods, we find evidence of a case of a unit root in all three factors and case of a unit root in the level and slope of the yield curve but not in the curvature factor. Moreover, we find very few empirical evidence for the (theoretical) weak-form of the expectations hypothesis of interest rates.

Sala 2W15 (Edifº I) – Tel.: 210 464 231 - E-mail: andreia_garcia@iscte.pt