ZÜRCHER *KOLLOQUIUM ÜBER ANWENDUNGSORIENTIERTE* STATISTIK

Einladung zum Kolloquium

Thema   **Exploring the trade-off between robustness and diagnostics when selecting single factor models for the short term rate**

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Abstract

We explore the trade-off between robustness and diagnostics in applications to the model choice of single-factor interest rate models. The analysis is carried out using a robust version of the Generalized Method of Moments (the R-GMM) that has been recently developed in Ronchetti and Trojani (2001). The GMM is a broadly used econometric procedure in finance that permits estimation and testing of highly non linear models with quite rich time series dependence structures. However, as for many inference procedures based on M-type estimators GMM suffers from a lack of robustness when the orthogonality functions defining the corresponding estimating equations is unbounded (a feature that is inherited by virtually all GMM applications in finance). Therefore, RGMM is a useful tool in these applications which can help to obtain more robust point estimates and model choices and to identify outliers or more general deviating structures to eventually (if this is necessary) respecify a model. As an illustration of this methodology we re-examine the empirical evidence concerning a well-known class of linear and non-linear drift single factor models for the short rate process (cf. Chan et al. (1992) (CKLS) and Ahn and Gao (1999), AG). Standard GMM model selection procedures are highly unstable in these applications. Specifically, when testing the models with RGMM we find that they are all clearly misspecified and we identify a clustering of influential observations in the 1979-1982 subperiod. Further, even a model with a temporary parameter shift is unable to take into account the particular 1979-1982 subperiod which exhibits a cluster of influential points similar to that obtained for the constant parameter models. On the other hand, a Cox-Ingersoll-Ross model could offer a satisfactory data description for the period after 1982 since there only a few isolated outliers are found. Comparable results are obtained for the Euro-mark case.

(Joint talk with: **Talks in <u>Financial and Insurance Mathematics</u>**)

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