mgarch: A Package for the Analysis of Multivariate Garch Models

Harald Schmidbauer and Vehbi Sinan Tunalioglu

In recent years, conditional heteroskedasticity (CH) models have become the workhorse in the study of returns on assets, their purpose being in particular to provide insight into the impact of news on the volatility of asset returns. However, little free software is available for the analysis, in terms of CH models, of multivariate time series. We present a package which tries to make a contribution in this direction. Our package provides elementary functionality to build a synchronized multivariate time series of daily or weekly returns, on the basis of separate univariate level series, which need not be in sync (i.e., different days may be missing). The main part of the package consists of functions which permit the estimation of MGARCH-BEKK and related models, among them a novel bivariate asymmetric model which is capable of distinguishing between positive and negative returns. Diagnostic tools are also included.