ABSTRACT:
A rank-based technique for estimating GARCH model parameters is considered. The estimators are obtained by minimizing a rank-based residual dispersion function similar to the one given in L.A. Jaeckel [Estimating regression coefficients by minimizing the dispersion of the residuals, Ann. Math. Statist. 43 (1972) 1449–1458]. They are useful for GARCH order selection and preliminary estimation. We give a limiting distribution for the rank estimators which holds when the true parameter vector is in the interior of its parameter space, and when some GARCH parameters are zero. The limiting theory is used to show that the rank estimators are robust, can have the same asymptotic efficiency as maximum likelihood estimators, and are relatively efficient compared to traditional Gaussian and Laplace quasi-maximum likelihood estimators. The behavior of the estimators for finite samples is studied via simulation, and we use rank estimation to fit a GARCH model to exchange rate log-returns.