ABSTRACT

Risk management technology applied to high dimensional portfolios needs simple and fast methods for calculation of Value-at-Risk (VaR). The multivariate normal framework provides a simple off-the-shelf methodology but lacks the heavy tailed distributional properties that are observed in data. A principle component based method (tied closely to the elliptical structure of the distribution) is therefore expected to be unsatisfactory. Here we propose and analyze a technology that is based on Independent Component Analysis (ICA) in combination with Generalized Hyperbolic (GH) distributions. These distributions offer a flexible alternative. We study the proposed GHADA (adaptive choice of volatility) and GHICA methodology in an extensive simulation study and apply it to a high dimensional portfolio situation. Our analysis yields accurate VaRs.

Keywords: independent component analysis, Value-at-Risk JEL code: C14, C15, C32, C53, G20

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