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Multiple Period Value at Risk Estimation under Quadratic GARCH Models

We derived the exact conditional second, third and fourth moments of returns and their temporal aggregates under Quadratic GARCH models. Three multiple period Value at Risk estimation methods are proposed. Two methods are based on the exact second to fourth moments and the other adopts a Monte Carlo approach. Some simulations show that the multiple period Value at Risk calculated from an asymmetric t-distribution with the variance, skewness parameter and the degrees of freedom chosen to match the second to fourth moments of the aggregate returns is close to the one obtained by Monte Carlo simulations. Using some market indices for illustration, the proposed Value at Risk estimation methods are found to work well.