

Non-Gaussian Conditional Volatility Estimates for Multivariate Returns

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Abstract:

This study includes the development of algorithms for the estimation of parameters for a financial return model. The Vector Autoregressive (VAR) and the Generalized Orthogonal GARCH (GO-GARCH) models were used to represent the financial returns, resulting in a non-Gaussian conditional volatility model for multivariate returns. As an example, the model was used for the evaluation of portfolio risk. As objective measures of risk, the Value at Risk (VaR) and Conditional Value at Risk (CVaR) measures were used due to their popularity and properties. Using historical price series of a few stocks that are traded on BM&FBovespa, it was possible to verify that the VAR and GO-GARCH models were appropriate to represent the returns of the selected stocks, as the adopted model was able to capture the dynamics of the returns correctly. The evaluation of portfolio risk was also appropriate, as the VaR violations observed in the backtesting procedures were found to be independent and to occur with the expected frequency.