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PROBABILITY-UNBIASED VAR ESTIMATOR FOR NON-GAUSSIAN DISTRIBUTIONS

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PROBABILITY-UNBIASED VaR ESTIMATOR FOR NON-GAUSSIAN DISTRIBUTIONS

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We analyze the relevance of the probability unbiasedness property to obtain good quantile or Value at Risk (VaR) estimators for Student-t and mixtures of Normal distributions. In the special case of the Normal distribution, a closed-form solution for probability-unbiased VaR is given. Lacking a closed-form solution for the general case, we use a bootstrapping algorithm and illustrate the outcomes obtained by simulating random samples of different size generated from Student-t and from different Mixtures of Normal distributions. Using the empirical distribution for the VaR estimate, we can estimate the probability-unbiased VaR as well as probability-unbiased confidence intervals for VaR estimator from short samples. Finally, the probability-unbiased VaR estimator is tested on actual time series data, showing that it outperforms a variety of standard VaR models, all of which are much more complex. The findings in this paper suggest that the unbiased VaRestimator is a valuable tool for the practice of risk management.