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Robust Normal Mixtures for Financial Portfolio Allocation

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A new approach for multivariate modeling and prediction of asset returns is proposed. It is based on a two-component normal mixture, estimated using a fast new variation of the minimum covariance determinant (MCD) method made suitable for time series. It outperforms the (shrinkage-augmented) MLE in terms of out-of-sample density forecasts and portfolio performance. In addition to the usual stylized facts of skewness and leptokurtosis, the model also accommodates leverage and contagion effects, but is i.i.d., and thus does not embody, for example, a GARCH-type structure. Owing to analytic tractability of the moments and the expected shortfall, portfolio optimization is straightforward, and, for daily equity returns data, is shown to substantially outperform the equally weighted and classical long-only Markowitz framework, as well as DCC-GARCH (despite not using any kind of GARCH-type filter).

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