

## Combining the Dynamic Conditional Correlation and Range-GARCH Models to Improve Covariance Forecasts

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**Abstract :** The dynamic conditional correlation model of Engle (2002) is one of the most popular multivariate volatility models. However, this model is based solely on closing prices. It has been documented in the literature that the high and low price of the day can be used in an efficient volatility estimation. We, therefore, suggest a model which incorporates high and low prices into the dynamic conditional correlation framework. Empirical evaluation of this model is conducted on three datasets: currencies, stocks, and commodity exchange-traded funds. The utilisation of realized variances and covariances as proxies for true variances and covariances allows us to reach a strong conclusion that our model outperforms not only the standard dynamic conditional correlation model but also a competing range-based dynamic conditional correlation model.

**Keywords :** volatility, DCC model, high and low prices, range-based models, covariance forecasting

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