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EVALUATING CORRELATION FORECASTS UNDER ASYMMETRIC LOSS

Abstract:

Correlation indicates the strength of the linear relationship between two random variables and is therefore relevant for asset pricing, portfolio choice and risk management. In addition, forecasts of correlation dynamics allow for a better evaluation of the systemic risk and may give an initial signal about potential crises (Engle (2009)).

This paper aims to evaluate daily correlation forecasts. For the calculation of the correlation forecasts, the BEKK model of Engle and Kroner (1995) and the DCC model of Engle (2002) are applied. Since there is no clear suggestion regarding the sampling scheme to estimate the realized correlations from intraday data (Andersen et al. (2006)), several experimental schemes with different sampling intervals are examined. Following Komunjer and Owyang (2012), a multivariate loss function which may be asymmetric is used to measure the distance between model correlation forecasts and realized correlations.

The data sample contains intraday high-frequency and closing prices of the three major US indices: S&P 500, NASDAQ 100 and Russell 2000. Based on the results obtained so far, the following conclusions can be drawn: (i) Both models better predict correlations for the pair S&P 500 and NASDAQ 100 than for Russell 2000 and other two indices. (ii) The DCC model performs better than the BEKK model applying the symmetric loss function. (iii) On the basis of the correlation pairs between the Russell 2000 index and other two indices, the optimal degrees of asymmetry are negative for the BEKK forecast errors and positive for the DCC forecast errors in most cases. (iv) The degrees of asymmetry depend on the choice of sampling schemes for calculating the realized correlations. (v) Both models are unable to capture the sudden decrease of correlations during the crisis period.

Keywords:

Correlation forecasting, BEKK, DCC, asymmetric loss function

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