Estimating and Modeling Tick-by-Tick Stock-Bond Realized Correlation

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Abstract

We adapt the Hayashi and Yoshida (2005) tick-by-tick covariance estimator to the case of rounding in the price time stamps and investigate, through Monte Carlo simulations, the behavior of such estimator under market microstructure conditions analogous to that of the financial data studied in the empirical part. Moreover, we provide empirical evidence that the Heterogeneous Autoregressive (HAR) process is a simple and parsimonious model for the estimation and prediction of realized correlations. In the empirical analysis on S&P 500 and 30 years Treasury Bond futures we studied realized correlation series obtained from volatilities and covariances both computed with tick-by-tick data finding significant evidence of the presence of long memory and structural changes. Finally, we show that the proposed HAR model is able to describe well the dynamic properties of the stock-bond correlation and to provide accurate out of sample forecasts.