Simple scalable benchmarks for realized covariance forecasts

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Abstract

The Heterogeneous Autoregressive (HAR) model of Corsi (2009) has become the benchmark model for predicting realized volatility, given its simplicity and consistent empirical performance. With the widespread availability of high-frequency data, the recent literature has focused on employing realized (variance)-covariance matrix (RCOV) to build forecasting models. As the dimension of the set of assets in question increases, the number of coefficients also increases. While restricted models are popular, which avoid the worst effects of parameter proliferation, the regression problem grows in size as more assets are included.

We propose a moving averaging benchmark for the RCOV matrix based on the HAR structure and equal weights known to perform well in many forecasting contexts. This avoids parameter estimation required in full models and provides two significant benefits. First, it is a scalable approach in that it avoids the issues of parameter proliferation. Second, with no parameter estimation, this approach also avoids the need for non-linear transformations to mitigate the effect of spikes/outliers, heteroscedasticity and structural breaks in the time series of the elements in the RCOV matrix. We show that this approach performs well relative to the recent successful benchmarks.

Biography

Andrey Vasnev is the Head of the Discipline of Business Analytics at the University of Sydney Business School. He graduated in Applied Mathematics from Moscow State University in 1998. In 2001 he completed his Master's degree in Economics at the New Economic School, Moscow. In 2006 he received a PhD degree in Economics from the Department of Econometrics and Operations Research at Tilburg University under the supervision of Jan R. Magnus. He worked as a credit risk analyst in ABN AMRO bank before joining the University of Sydney in 2008, where he currently works.