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The one-trading-day-ahead forecast errors of intra-day realized volatility

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Abstract

Two volatility forecasting evaluation measures are considered; the squared one-day-ahead forecast error and its standardized version. The mean squared forecast error is the widely accepted evaluation function for the realized volatility forecasting accuracy. Additionally, we explore the forecasting accuracy based on the squared distance of the forecast error standardized with its volatility. The statistical properties of the forecast errors point the standardized version as a more appropriate metric for evaluating volatility forecasts.

We highlight the importance of standardizing the forecast errors with their volatility. The predictive accuracy of the models is investigated for the FTSE100, DAX30 and CAC40 European stock indices and the exchange rates of Euro to British Pound, US Dollar and Japanese Yen. Additionally, a trading strategy defined by the standardized forecast errors provides higher returns compared to the strategy based on the simple forecast errors. The exploration of forecast errors is paving the way for rethinking the evaluation of ultra-high frequency realized volatility models.

Keywords: ARFIMA model, HAR model, intra-day data, predictive ability, realized volatility, ultra-high frequency modelling.

JEL Classifications: C14; C32; C50; G11; G15.

1. Introduction

A volatility forecasting evaluation framework that brings together a well defined measure with known statistical properties is applied for predicting one-trading-day-ahead realized volatility. Any evaluation (or loss) function is a measure of accuracy constructed

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