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Title: New Tests of Forecast Optimality Across Multiple Horizons

Abstract: We propose new tests of forecast optimality that exploit information contained in multi-horizon forecasts. In addition to implying zero forecast bias and zero autocorrelation in forecast errors, we show that forecast optimality under squared error loss also implies testable restrictions on second moments corresponding to long and short forecast horizons. In particular, the variance of the forecast error should be increasing in the horizon; the variance of the forecast itself should be decreasing in the horizon; and the variance of forecast revisions should be bounded by twice the covariance of revisions with the target variable. These bounds on second moments can be restated as inequality constraints in a regression framework and tested using the approach by Wolak (1989). Moreover, the tests can be conducted without the need for data on the target variable, which is particularly useful when this is subject to large measurement error. We also propose a new univariate test of forecast rationality that constrains the coefficients in a regression of the target variable on the long-horizon forecast and the sequence of interim forecast revisions. Size and power of the new tests are compared with those of conventional orthogonality tests through Monte Carlo simulations. An empirical application to the Federal Reserve's greenbook forecasts is used to illustrate the tests.

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