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## Tests of Equal Accuracy for Nested Models with Estimated Factors \*

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**Abstract**

In this paper we develop asymptotics for tests of equal predictive ability between nested models when factor-augmented regressions are used to forecast. We provide conditions under which the estimation of the factors does not affect the asymptotic distributions developed in Clark and McCracken (2001) and McCracken (2007). This enables researchers to use the existing tabulated critical values when conducting inference despite the presence of estimated predictors. As an intermediate result, we derive the asymptotic properties of the principal components estimator over recursive windows. We provide simulation evidence on the finite sample effects of factor estimation and apply the tests to the case of forecasting excess returns to the S&P 500 Composite Index.

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**Keywords:** factor model, out-of-sample forecasts, recursive estimation

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