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A new approach to statistical arbitrage: Strategies based on dynamic factor models of prices and their performance

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Abstract

Statistical arbitrage strategies are typically based on models of *returns*. We introduce a new statistical arbitrage strategy based on dynamic factor models of *prices*. Our objective in this paper is to exploit the mean-reverting properties of prices reported in the literature. We do so because, to capture the same information using a return-based factor model, a much larger number of lags would be needed, leading to inaccurate parameter estimation. To empirically test the relative performance of return-based and price-based models, we construct portfolios (long-short, long-only, and equally weighted) based on the forecasts generated by two dynamic factor models. Using the stock of companies included in the S&P 500 index for constructing portfolios, the empirical analysis statistically tests the relative forecasting performance using the Diebold–Mariano framework and performing the test for statistical arbitrage proposed by Hogan et al. (2004). Our results show that prices allow for significantly more accurate forecasts than returns and pass the test for statistical arbitrage. We attribute this finding to the mean-reverting properties of stock prices. The high level of forecasting accuracy using price-based factor models has important theoretical and practical implications.

JEL classification

G11; G12; G17

Keywords

Statistical arbitrage; Return-based factor models; Price-based factor models; Diebold–Mariano framework; Long-short strategies; Long-only strategies

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