

# Portfolio Choice Implications of Factor Models

Under

## Parameter and Model Uncertainty

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### **Abstract**

This paper examines the portfolio choice implications of incorporating parameter and model uncertainty in (conditionally) linear factor models using industry portfolios. I specifically examine a CAPM, a linear factor model with different predictor variables (dividend yield, price to book ratio, price to earnings ratio, and price to sales ratio) and a time-varying CAPM. All approaches incorporate parameter uncertainty in a mean-variance framework. It is shown that taking into account the time variation in market betas improves the portfolio performance as measured, e.g., by the Sharpe ratio compared to both an unconditional CAPM and a linear factor model with predictor variables. I also show the implications of using a Black-Litterman framework versus using a standard mean-variance framework in the asset allocation step. Black-Litterman framework can be thought as a model averaging approach and thus deals with the parameter and model uncertainty problems. I show that Black-Litterman approach results in an optimal portfolio that has a better Sharpe ratio than Sharpe ratios obtained by a standard mean-variance framework and using a single model.