

JOB MARKET TOPIC

**A SEMIPARAMETRIC CHARACTERISTICS-BASED FACTOR
MODEL**

February 17, 2021

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February 17, 2021

- *Part 1*

Dynamic Peer Groups of Arbitrage Characteristics (with Shuyi Ge and Oliver Linton)

Revised and Resubmitted, Journal of Business & Economic Statistics

KEYWORDS: Semiparametric; Characteristics-based; Asset pricing; Power-enhanced test;

- We propose an asset pricing factor model constructed with semi-parametric characteristics-based mispricing and factor loading functions. We approximate the unknown functions by B-splines sieve where the number of B-splines coefficients is diverging. We estimate this model and test the existence of the mispricing function by a power enhanced hypothesis test. The enhanced test solves the low power problem caused by diverging B-spline coefficients, with the strengthened power approaches to one asymptotically. We also investigate the structure of mispricing components through Hierarchical K-means Clusterings. We apply our methodology to CRSP (Center for Research in Security Prices) and FRED (Federal Reserve Economic Data) data for the US stock market with one-year rolling windows during 1967-2017. This empirical study shows the presence of mispricing functions in certain time blocks. We also find that distinct clusters of the same characteristics lead to similar arbitrage returns, forming a "peer group" of arbitrage characteristics.

- *Part2*

A Dynamic Semiparametric Characteristics-based Model for Optimal Portfolio Selection

(with Gregory Connor and Oliver Linton)

Under review

KEYWORDS: Portfolio Management; Single index; GMM;

- This paper develops a two-step semiparametric methodology for portfolio weight selection for characteristics-based factor-tilt and factor-timing investment strategies. We build upon the expected utility maximization framework of Brandt (1999) and Aït-sahalia and Brandt (2001). We assume that assets returns obey a characteristics-based factor model with time-varying factor risk premia as in Li and Linton (2020). We prove under our return-generating assumptions that in a market with a large number of assets, an approximately optimal portfolio can be established using a two-step procedure. The first step finds optimal factor-mimicking sub-portfolios using a quadratic objective function over linear combinations of characteristics-based factor loadings. The second step dynamically combines these factor-mimicking sub-portfolios based on a time-varying signal, using the investor's expected utility as the objective function. We develop and implement a two-stage semiparametric estimator. We apply it to CRSP (Center for Research in Security Prices) and FRED (Federal Reserve Economic Data) data and find excellent in-sample and out-sample performance consistent with investors' risk aversion levels.