Abstract

We show that a non-parametric estimate of the pricing kernel, extracted using an information-theoretic approach, delivers \emph{out-of-sample} smaller pricing errors and better cross-sectional fit than leading factor models, and identifies the maximum Sharpe ratio portfolio. This \emph{information SDF} identifies a novel source of risk not captured by Fama-French and momentum factors, revealing an ‘information anomaly’ that generates annualized alphas of about 9\%-24\%. A tradable information portfolio that mimics this kernel has high out-of-sample Sharpe ratio (about 1 or more), outperforming both the $1/N$ benchmark and Value and Momentum strategies combined. These results hold for wide cross-sections of test portfolios.

\textit{Keywords}: Pricing Kernel, Relative Entropy, Factor Models, Factor Mimicking Portfolios, Alpha.

\textit{JEL Classification Codes}: G11, G12, G13, C13, C53

---

*We benefited from helpful comments from Andrew Ang, George Constantinides, Magnus Dahlquist, Francis Diebold, Ralph Koijen, Dong Lou, Ian Martin, Toby Moskowitz, Christopher Polk, Tarun Ramadorai, Robert Stambaugh, Romeo Tedongap, Raman Uppal, Jessica Wachter, Irina Zviadadze, and seminar participants at Wharton, ICEF, LSE, Stockholm School of Economics, ESSFM 2015 Conference in Gerzensee, and the EEA 2015 Annual Meeting. Any errors or omissions are the responsibility of the authors. Christian Julliard thanks the Economic and Social Research Council (UK) [grant number: ES/K002309/1] for financial support.

†Tepper School of Business, Carnegie Mellon University; anishagh@andrew.cmu.edu.

‡Department of Finance and FMG, London School of Economics, and CEPR; c.julliard@lse.ac.uk.

§Department of Finance, Manchester Business School; alex.taylor@mbs.ac.uk.