A Talk by
R. Douglas Martin

Fama-French 1992 Redux with Robust Statistics
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ABSTRACT

We begin with a brief overview of the theoretical foundations of robust statistics, including a standard outlier generating model and an optimal bias robust regression estimator. The latter is very useful for cross-section regression in empirical asset pricing research, as well as for fundamental factor model fitting. We focus on the application of the optimal robust regression estimator to the main models studied by Fama and French in their 1992 empirical asset pricing paper “The Cross-Section of Expected Stock Returns” (FF92), as well as application to two important models not considered by FF92. In doing so, we consider the time intervals 1963-2015 and 1980-2015, as well as the FF92 1963-1990 interval. The results show quite dramatically that the FF92 least squares fits are highly influenced by quite small fractions of outliers in the cross-sections, resulting in misleading conclusions concerning the behavior of the cross-section of returns for the vast majority of the equities. The robust regressions are not much influenced by outliers, and lead to opposite conclusions than some of those in FF92. In particular, robust regression shows that the size factor effect is positive rather than negative and highly significant, the beta factor effect is negative and significant rather than insignificant. Furthermore, a simple $E/P$ factor not considered by FF92 is positive and highly significant, and all three factors in a size and beta model with interaction are highly significant. We note that a robust location estimator special case of the robust regression estimator has an important application to the time series of robust regression slopes, as well as to decile analysis of returns versus factors. We close with a strong recommendation to use the optimal bias robust regression estimator in empirical asset pricing research, and for fundamental factor model fitting.

(Joint work with Christopher G. Green)

BIO

Professor R. Douglas Martin began his academic career in Electrical Engineering at the University of Washington and subsequently moved to the Statistics Department, where he was the second Chair of Statistics. In 2012 he moved to the Applied Mathematics Department to develop a new self-sustaining MS degree program in Computational Finance and Risk Management. A consultant in the Mathematics and Statistics Research Center at Bell Laboratories from 1973 to 1983, Martin later founded Statistical Sciences to commercialize the S language for data analysis and statistical modelling in the form of S-PLUS. Subsequently he was a co-founder and Chairman of FinAnalytica, Inc., developer of the Cognity portfolio construction and risk management system, serving as CEO from 2006 to 2008. Martin has authored numerous publications on time series and robust statistical methods, and is co-author of two books: Modern Portfolio Optimization (2005) and the second edition of Robust Statistics: Theory and Methods (2018). His research is on applications of modern statistical methods in finance and investment. He holds a Ph.D. in Electrical Engineering from Princeton University. Martin retired from the Applied Mathematics and Statistics Departments in June 2016, and remains active in basic research projects with students, and former PhD students and other colleagues in the finance industry. He is also active in mentoring students in Google Summer of Code projects focused on quantitative finance open source software.