



UNIVERSITY OF DELAWARE
**LERNER BUSINESS
& ECONOMICS**

Institute for Financial Services Analytics
Distinguished Speaker Series

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Smith School of Business, University of Maryland, College Park
Friday, March 1, 2019
10:30 a.m. – 12:00 p.m.
One South Main, Room 120

Cross-Sectional and Time-Series Applications of Machine Learning Methods



Employing a semi-parametric method known as Boosted Regression Trees (BRT), this study looks at forecasting stock returns and volatility at the monthly frequency. BRT is a statistical method that generates forecasts on the basis of large sets of conditioning information without imposing strong parametric assumptions such as linearity or monotonicity. It applies soft weighting functions to the predictor variables and performs a type of model averaging that increases the stability of the forecasts and therefore protects it against overfitting. Results indicate that expanding the conditioning information set results in greater out-of-sample predictive accuracy compared to the standard models proposed in the literature and that the forecasts generate profitable portfolio allocations even when market frictions are considered. By working directly with the mean-variance investor's conditional Euler equation we also characterize semi-parametrically the relation between the various covariates constituting the conditioning information set and the investor's optimal portfolio

weights. Results suggest that the relation between predictor variables and the optimal portfolio allocation to risky assets is highly non-linear.

In a second study, we look at the effects of the largest US robo-adviser, Vanguard Personal Advisor Services (PAS), on investor performance. Across all clients, PAS reduces investors' holdings in money market mutual funds and increases bond holdings. It reduces the holdings of individual stocks and US active mutual funds, and moves investors towards low-cost indexed mutual funds. Finally, it increases investors' international diversification and investors' overall risk-adjusted performance. From sign-up, it takes approximately six months for PAS to adjust investors' portfolios to the new allocations. Using a machine learning algorithm, known as Boosted Regression Trees (BRT), to explain the cross-sectional variation in the effects of PAS on investors' portfolio allocation and performance, the study found the investors that benefit the most from robo-advising are the clients with little investment experience, as well as the ones that have high cash-holdings and high trading volume pre-adoption. Clients with little mutual fund holdings and clients invested in high-fee active mutual funds also display significant performance gains.

Alberto Rossi is an Associate Professor of Finance at the Smith School of Business, University of Maryland at College Park. His research interests include empirical asset pricing, FinTech. His recent work concentrates on Robo-Advising and the application of machine learning methods in finance. Professor Rossi's work has been published in leading academic journals such as the Journal of Finance and the Review of Financial Studies. His teaching interests include econometrics, investments and asset pricing. Before joining the Smith School, he worked as an economist at the Board of Governors of the Federal Reserve System in Washington DC. He received his PhD in Economics from the University of California, San Diego.