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PRACTITIONER'S DIGEST

The "Practitioner's Digest" emphasizes the practical significance of manuscripts featured in the "Insights" and "Articles" sections of the journal. Readers who are interested in extracting the practical value of an article, or who are simply looking for a summary, may look to this section.

TAX-RATE ARBITRAGE: REALIZATION OF LONG-TERM GAINS TO ENABLE SHORT-TERM LOSS HARVESTING PAGE 13

Lisa Goldberg, Taotao Cai and Pete Hand

Delaying the realization of capital gains and methodically harvesting losses are mainstays of tax-managed investing. For decades, the application of these techniques in portfolios that directly index US and global equity markets has delivered strong performance to taxable investors while increasing the after-tax value of their external realized gains. However, rising equity markets and the action of loss-harvesting itself make loss harvesting more difficult over time, since the ratio of cost basis (or purchase price) to market price tends to diminish as a portfolio ages. This ossification of tax-managed portfolios has prompted the development of life-extending enhancements to standard loss harvesting.

This article features a particular enhanced loss-harvesting strategy, tax-rate arbitrage, which exploits the fact that gains on securities held for more than a year are taxed at a lower rate than securities held for a year or less. Tax-rate arbitrage selectively raises cost basis through targeted realization of long-term gains, which potentially increases opportunities to realize short-term losses. Properly calibrated, this strategy may increase tax alpha relative to what is offered in a standard loss-harvesting strategy for specific types of investors.

We carry out an empirical study of the incremental rewards and risks of tax-rate arbitrage benchmarked against a standard loss-harvesting strategy, in which we do not deliberately realize gains. For the ideal tax-rate arbitrage investor, the strategy generated an average of 0.78% in excess after-tax active return at a 10-year horizon relative to a standard loss-harvesting strategy. Other investors may benefit from tax-rate arbitrage but typically to a lesser extent.

PORTFOLIO PERFORMANCE ATTRIBUTION VIA SHAPLEY VALUE PAGE 33

Nicholas Moehle, Stephen Boyd and Andrew Ang

Return attribution divides up the total performance of a portfolio into returns that are due to different features included in the investment process, plus a baseline value which corresponds to what the performance would have been with all the features off. The difficulty in performance attribution is that the features are correlated, or that the marginal performance gain from adding one feature depends on which other features are turned on. The authors show that a specific attribution method due to Shapley is the only attribution that satisfies four properties: (1) residual-free attribution, which means that the sum of amounts attributed to each feature, plus the baseline value, equals the actual performance of the portfolio, (2) if no features are turned on performance is equal to the baseline, (3) symmetry, or that for any permutation of the features the attributions are permuted the same way, and (4) monotonicity, where if one feature's marginal contribution does not decrease no matter which other features are already active, then the attribution to that feature does not decrease. Other attribution methods like one-at-a-time, of which the traditional Brinson-Hood-Beebower (in Brinson *et al.*, 1986) is a special case, leave-one-out, and sequential attribution which adds features in a particular order do not satisfy one or more of these conditions. The drawback in applying Shapley attribution is that the number of optimizations required increases exponentially in the number of features, but the authors also discuss numerical methods to approximate the Shapley attribution.

JUST SAY NO TO LEVERAGED ETFS PAGE 53

Ziemowit Bednarek and Pratish Patel

In this article, we compare the risk-reward trade-off of investing in a Leveraged ETF (LETF) relative to the benchmark. We find that the Sharpe Ratio (SR) adequately and sufficiently captures the trade-off both theoretically and empirically.

Further, we demonstrate that a variety of performance measures depend monotonically on the SR. Since the SR of an LETF is lower than that of the benchmark for all investment horizons, the same holds for other performance measures.

Our findings are relevant for both investors and regulators.

WHAT'S IN THE MONEYNESS? MONEYNESS SPREAD AND FUTURE STOCK RETURNS PAGE 70

Zhan Li

We construct moneyness spread, an option-based trading signal, to predict stock returns. Moneyness spread is the weighted average difference in moneyness between calls and puts. An option's moneyness is defined as the ratio of its strike price to its underlying stock's price. Moneyness spread is weighted by an option's dollar trading volume or its open interest.

We find a significant and positive relation between moneyness spread and stock returns from 2005 to 2020. A long-short portfolio that buys stocks of high moneyness spread and shorts stocks of low moneyness spread generates economically and statistically significant raw and risk-adjusted returns (alphas). The returns and alphas of the long-short portfolio are persistent, remaining significant up to at least 15 days.

The long-short portfolio provides good investment performance after accounting for transaction costs and portfolio turnover: Over the sample period of 2005 to 2020, the daily-rebalanced portfolio based on open interest-weighted moneyness spread has an annualized return of 17.43%, a maximum drawdown of 17.40%, and a Sharpe ratio of 1.37; the quarterly-rebalanced portfolio based on dollar volume-weighted moneyness spread has an annualized return of 13.78%, a maximum drawdown of 12.98%, and a Sharpe ratio of 1.15.