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DETECTING TRUE ALPHA IN HIGHLY COMPETITIVE MARKETS

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- Financial markets are highly competitive.
- True alpha (manager skill) is rare in public equity.
- Combining robust alphas with selectivity may help identify skilled managers.

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The efficient markets hypothesis says that financial markets incorporate all available information in real time to price securities competitively, eliminating opportunities to earn excess return. The Nobel Committee split its 2013 prize for Economic Sciences between proponents of both sides of the market efficiency debate.[1] For investment practitioners, the real question is whether there are skilled investment managers who can capture risk-adjusted excess return (alpha) net-of-fees, and how to identify them.

To investigate this question rigorously, one must employ methods that can attribute performance to risk, skill or luck. Capital market returns are noisy, and we must be careful not to interpret information from noise. The Fama French Carhart (FFC) four-factor model is the primary model for performance evaluation in academic research. It attributes performance to one of four risk factors:

- Market factor (exposure to broad stock market risk);
- Size factor (relative exposure to small stocks);
- Value factor (relative exposure to value stocks); and
- Momentum factor (exposure to stocks that previously experienced relative price appreciation).

The four risk factors share three important features that make them important for performance evaluation:

- They offer true return premiums;
- They are independent sources of return; and
- They explain the return variation (compensated risk) of diversified equity portfolios.

This is distinct from alpha, which represents the additional return from manager skill (such as security selection and market timing) after accounting for the return attributed to the four risk factors.

Eugene Fama and Ken French (2010) employed the FFC four-factor model and found no evidence of alpha net of expenses among even the top-performing U.S. equity mutual funds, though they found evidence of alpha before expenses among the very top performers.[2] Cremers and Petajisto (2009) defined active share as the degree to which a fund's holdings deviate from its stated benchmark index. A fund that deviates little has low active share and is very similar to the benchmark index. In contrast, the holdings of high active-share funds are very different from the benchmark's holdings. Cremers and Petajisto found that high active-share funds outperformed low active-share funds. However, they had to modify the FFC four-factor model and employ a high-turnover, long-short fund holding strategy to achieve meaningful results.[3] Related but more compelling, Amihud and Goyenko (2013) defined selectivity as the proportion of a fund's return variation not explained by the FFC four-factor model (100% - R^2). They found that high selectivity is a predictor of fund performance.[4] Selectivity is more rigorous than active share in that it does not depend on a stated benchmark (which is less representative with high active share), uses the correctly defined FFC four-factor model and does not require an impractical long-short fund trading strategy to produce meaningful results.

At Northern Trust, we borrowed the factor-based performance and risk-evaluation framework from academia and pragmatically apply these powerful tools and methods to screening, selecting and monitoring our active, skill-based managers. We recently tested the Morningstar universe of active institutional share-class U.S. equity mutual funds by using the FFC four-factor model to compare our results to the academic research. We focused on institutional share-class funds because they offer lower expense ratios, and high-net-worth investors do not typically pay retail fees.

The sample included 959 funds that we tested with the FFC four-factor model over the five-year period ended December 2014. Exhibit 1 displays the summary results.

The real question is whether there are skilled investment managers who can capture risk-adjusted excess return (alpha) net-of-fees, and how to identify them.

The FFC four-factor model explains an average of 95% of the return variation of the funds in the sample, indicating that the four risk factors in combination do an excellent job explaining fund return and risk as well as estimating risk-adjusted performance across the sample. The average alpha is -0.82%, which is nearly identical to the average expense ratio of 0.85%. On average, active funds did not deliver alpha, and expenses fully explain the magnitude of underperformance.

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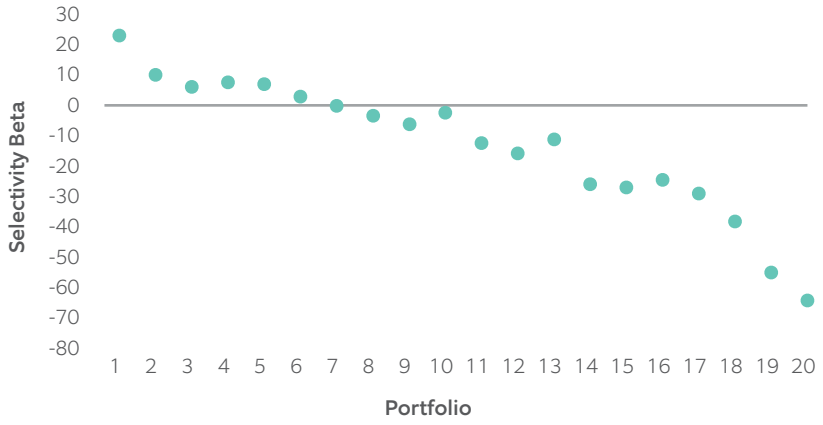
There is a consensus on the average results, but what about top-performing managers? To answer this question, we need to separate luck from skill and assess fund performance in the far-right tail (the top performing 2.5%) of the sample. In assessing luck, we recognize and expect that some funds will be top performers merely by chance. The t-statistic (t-stat) tells us whether the observed alpha is likely true instead of just a random result. A t-stat greater than 2.0 is considered statistically significant, as it indicates to a 95% confidence level that the alpha is likely true. With a sample of 959 funds, 24 funds should have produced statistically significant positive alpha just by chance, and an observation of more than 24 funds is evidence of manager skill. We found only 22 funds in the right tail. In contrast, we found 119 funds in the left tail producing statistically significant negative alpha (vs. 24 predicted by chance), largely due to the weight of fees. These results make clear that most of what is commonly expressed as alpha is either random luck or the result of imprecise adjustment for risk (e.g., using index benchmarks or peer rankings instead of more-precise risk factor attribution). The findings also show that expenses matter – both on average and across the sample – even though our sample focused on lower-expense institutional share class funds. The overall results are consistent with Fama and French (2010).

EXHIBIT 1

Sample Summary	
Sample size	959
Average FFC four-factor R2	95%
Average expense ratio	0.85%
Average alpha	–0.82%
Number of funds with alpha – predicted by chance*	24
Number of funds with alpha – observed in sample*	22

Statistically significant positive alpha (t-stat > 2.0)
Source: Northern Trust Research; Morningstar

EXHIBIT 2



Source: Northern Trust Research; Morningstar

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Although alphas largely appear randomly distributed around the average expense ratio, we next show that the alphas of at least some of the high-performing funds may not be random. Indeed, our tail results are consistent with some evidence of true alpha before expenses among some top-performing funds.

Selectivity results from a manager's unique investment process, which is not random. If some alphas are sensitive to selectivity, then this may be evidence that those alphas associated with higher selectivity are related to manager skill and the investment process, and they are not just random. We tested the relationship between alpha t-stat and selectivity and found a weak but statistically significant relationship across the full sample. However, we want to separate true alpha from random alpha among the top-performing funds in particular, so next we sorted funds by alpha t-stat into 20 equal-weighted portfolios. Portfolio 1 is comprised of the top 5% of performing funds and Portfolio 20 is comprised of the bottom 5% of performing funds. Within each of the 20 portfolios sorted by alpha t-stat, we tested the sensitivity of alpha to selectivity by regressing alpha and (100%-R^2). Exhibit 2 shows selectivity betas for each of the 20 portfolios.

Among the six positive-alpha portfolios (Portfolios 1–6), the fund alphas within Portfolio 1 are the most sensitive to selectivity (highest positive selectivity beta). Since Portfolio 1 was formed from funds with the most-robust alphas (highest alpha t-stats), this finding suggests that a performance screen combining alpha t-stats with selectivity may be able

to separate top-performing managers with true alphas (true skill) from top-performing managers with random alphas (luck). This result is consistent with Amihud and Goyenko (2013). However, selectivity cuts both ways. Exhibit 2 also suggests that the negative alphas of unskilled managers within the worst-performing portfolios appear even more sensitive to poor selectivity (large negative selectivity betas).

Financial markets may not be perfectly efficient, but they are highly competitive pricing engines. Alphas are largely random, and our overall results suggest that true, non-random alpha is rare in public equity. The advice to employ passive equity or engineered equity solutions is good advice. For those who continue to seek alpha, a rigorous application of the tools and methods presented along with deep qualitative due diligence are critical to separating information from noise and improving the odds of success.

Notes

1 The prize was awarded to three individuals, including Eugene Fama and Robert Shiller.
2 Fama and French, "Luck Versus Skill in the Cross-Section of Mutual Fund Returns," *The Journal of Finance* (2010)
3 Cremers and Petajisto, "How Active Is Your Fund Manager? A New Measure that Predicts Performance," *The Review of Financial Studies* (2009).
4 Amihud and Goyenko, "Mutual Fund's R2 as Predictor of Performance," *The Review of Financial Studies* (2013)

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