



Mutual Funds vs. Indexes: Recent Empirical Findings about Skill & Luck

This is the first of a series of articles that we at Hammond Associates hope you will find interesting, informative, and useful as we jointly endeavor to make well-informed and rewarding investment decisions. Our objective is to elucidate the current thinking and research—from both practitioners and academics—on a variety of investment topics, distilling the analysis, insights, implications, and applications. Because research in finance and economics most often leads to at least as many new questions as it answers, these articles may not reveal simple, unqualified lessons or rules. They will, however, allow us to share with you the theory and evidence that we consider important to understanding and evaluating investment strategies and decision-making.

New Research Results on Mutual Fund Performance

This article considers the contributions of one particular recent research effort that investigates the decades-old question of whether active long-only equity managers can consistently “beat the market.” Rephrased, the question is “should investors seek out actively managed or passively managed funds?” The debate began in earnest in the 1960’s and was highlighted with work by Michael Jensen¹ showing that equity mutual funds generated negative alpha after netting out trading costs and management fees. Eugene Fama’s influential 1970 “Efficient Capital Markets”² ignited more interest and sent academics scurrying to produce empirical evidence that either supported or contradicted Efficient Market Theory. Academic efforts have continued unabated since then as more market anomalies present themselves to be tested and improved statistical techniques are developed to test (and re-test) them.

The paper we discuss herein has garnered attention since its first version came out in September 2005 and is receiving even broader interest in its revised and updated May 2008 version. In “False Discoveries in Mutual Fund Performance: Measuring Luck in Estimated Alphas”³ co-authors Laurent Barras, Olivier Scaillet, and Russ Wermers (BSW) use a recently developed statistical approach to evaluate the skill of active managers. BSW provide thorough discussions of their statistical techniques and test results, but we will present a much abbreviated overview of those. We will focus on summarizing their conclusions, which show that the majority of actively-managed domestic equity mutual funds have generated at least zero alpha after adjusting for luck, trading costs and fees. Their most encouraging conclusion is that, if investors can avoid what is shown to be a relatively small fraction of truly unskilled funds, they can expect to do at least as well with actively-managed funds as with passively-managed/index funds. Their most discouraging conclusion is that the proportion of truly skilled long-only equity fund managers who generate positive alpha has been shrinking over time.

We organize our discussion of BSW as follows: First, we summarize the authors’ main hypothesis, the data, and the statistical techniques utilized; second, we discuss their findings; and finally we extract the “nuggets.”

¹ Jensen, Michael, 1968, “The Performance of Mutual Funds in the Period 1945-64,” *Journal of Finance*, vol.23, 389-416.

² Fama, Eugene, 1970, “Efficient Capital Markets: A Review of Theory and Empirical Work,” *Journal of Finance*, vol. 25, 383-417.

³ Barras, Laurent, Olivier Scaillet, and Russ Wermers, 2008, “False Discoveries in Mutual Fund Performance: Measuring Luck in estimate Alpha,” Working Paper No. RHS-06-043, Robert H. Smith School of Business, University of Maryland.



Scope and Methodology

BSW's cross-sectional study is aimed at making general statements about the mutual fund industry rather than any single mutual fund. While their results may shed light on subsequent efforts to "pick the best mutual fund," they are concerned in this paper with evaluating performance over the full set of mutual funds and separating them into three categories—skilled, unskilled, and zero-alpha. They add to previous research by explicitly accounting for skill and luck, whereas earlier empirical work either assumes no luck or full luck, thus producing biased conclusions about the prevalence of truly skilled and truly unskilled fund managers.

Data:

BSW compile the gross and net returns of all U.S. open-end equity mutual funds from 1975 through 2006 and include all funds having at least 60 monthly return observations. The Thomson financial database is used to sort the mutual funds into categories according to investment objective. The final count in the study is 2,076 funds classified as Growth (1,304), Aggressive Growth (388), or Growth & Income (384).

Regression and Statistical Techniques:

Alpha (α) is estimated for each fund using a four-factor asset pricing model proposed by Carhart (1997)⁴. (The authors also estimate α using the simpler Capital Asset Pricing Model (CAPM) and two others and rerun all analyses for comparisons.) This step is not new but brings previous results "up to date."

BSW use the t-statistic (for α) as their performance measure following the "False Discovery Rate" (FDR) approach developed by Storey (2002).⁵ FDR approaches have been developed for use in the life sciences as a way to control or adjust for the rate of false positives (Type 1 errors) in multiple test situations. The basic idea is that any estimated t-statistic has an associated p-value or probability that another outcome is more extreme. The distribution of t-statistics (and p-values) is non-normal so a variety of bootstrapping techniques are necessary before the analysis can be completed. The end result will yield conclusions about the two tails (skilled and unskilled funds) and the remainder (zeroalpha funds).

Results

The BSW paper produces results for numerous tests, sub-tests, Monte Carlo simulations, and more. We summarize only the key performance results.

Long Term Performance:

The first step of the analysis—estimating α for each fund—yields results similar to other cross-sectional studies. There are funds with significant α , but portfolios of all funds with the same investment objective have negative estimated alphas (-0.45% to -0.60% annually).

The next step, the FDR analysis, considers the distribution of t-statistics, adjusts for luck, and concludes that 75.4% of the 2,076 funds are zero-alpha funds over their lifetimes. Of the remainder, only 0.6% are skilled while 24.0% are unskilled.

⁴Carhart, Mark M., 1997, "On Persistence in Mutual Fund Performance," *Journal of Finance*, Vol. 52, 57-82.

⁵Storey, John D., 2002, "A Direct Approach to False Discovery Rates," *Journal of the Royal Statistical Society*, Vol. 64, 479-498.

These results mean that 75.4% of funds had just enough stock-picking skill to cover their trading costs, fees, and other expenses. Put another way, these funds captured all of the α for themselves. The proportion of truly skilled funds is not significantly different from zero and much smaller than the proportion of significant- α funds. BSW report that the unskilled funds have characteristics that may help in their detection: they have higher expense ratios, higher turnover, and fewer assets under management than other funds—especially those in the right tail of the t-distribution. BSW are perplexed that these unskilled funds have an average life of 12.7 years (as of December 2006), which means that investors “haven’t figured it out.” Aside from hypothesizing that investors are unsophisticated or marketed to in a misleading way, they wonder if these are funds that exist as parts of very limited menus available to 401-k participants.

Short Term Performance

From the total set of returns data BSW construct six non-overlapping five-year periods, pool the five year records and obtain 3,311 α -estimates with associated t-statistics and p-values. (The same fund may participate in more than one five-year period and is treated as a separate fund investment opportunity whenever that occurs.) They perform the FDR analysis for each time period and estimate the proportion of skilled funds to be 2.4% instead of the long term estimate of 0.6%. In terms of generating short term α , BSW find that those classified as Aggressive Growth (which tend to invest in smaller capitalization companies) exhibit the highest proportion of skill. Growth & Income funds, which follow value and core styles, exhibit no true skill.

Skill Levels over Time

The number of mutual funds grew dramatically after 1990. In fact, about 100 new funds were added each year from 1996 to 2005. Did the new funds add more skill to investors’ opportunity set? BSW repeat their analysis for each year 1989 through 2005 (each time using the full returns experience available from 1975 through that year). They find that the average estimated annual α fell from +0.16% in 1989 to -0.97% in 2006. The proportion of skilled funds dropped from 14.4% to 0.6% and the proportion of unskilled funds increased from 9.2% to 24.0%. BSW can only wonder whether markets have become more efficient thus making stock-picking more difficult or whether newer funds are simply less skilled (more unskilled). They anecdotally report what we have also observed: many mutual fund managers with good track records have departed to start their own hedge funds, suggesting that mutual fund skill levels are simply lower on average.

Insights

The major contribution of BSW is their use of the FDR approach, which recognizes and adjusts for luck, that is, random chance that can lead to a “false positive.” Stated differently, the FDR approach helps distinguish between significant α and true skill. Based on their data set, their statistical estimation framework, and interpretation of results the following observations are noteworthy:

- Mutual funds with truly skilled stock pickers who generate true $\alpha > 0$ over the long run are hard to find and are becoming harder to find.
- Mutual funds that generate short term true $\alpha > 0$ do exist but are not easy to find because their production of positive α is short-lived or sporadic. BSW suggest that flows into funds that have achieved good performance may limit their ability to profit at the same rate as good stock-picking ideas have to be spread over more invested dollars. This may also mean that waiting for funds to achieve, say, five-year track records rules out capturing their greatest α production.
- Truly unskilled mutual funds represent about 24% of the universe. They should be fairly easy to identify as they have significant negative α , higher than average expense ratios and turnover, and lower assets under management.

- If the investor can avoid the truly unskilled mutual funds, the others are at least zero- α funds, meaning that the investor over the long run can expect to do at least as well as if he invested in a passive index fund.
- To do better than an index fund, investors must find funds in the right tail of the t-distribution. There is still the likelihood that some of those funds are actually lucky zero- α funds, but a low probability that they are extremely lucky unskilled funds.
- By holding a portfolio of funds in the right tail of the t-distribution, investors increase their expectation of earnings positive α , but constructing and rebalancing such a portfolio is no small challenge.
- Fees, expenses, and trading costs basically eat up all the α mutual funds can create. Therefore, avoiding high cost funds ceteris paribus should improve expected α .
- If a fund's managers and/or analysts start turning over or leaving to start their own hedge funds, the fund's skill level is likely to decline and expected α along with it.

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