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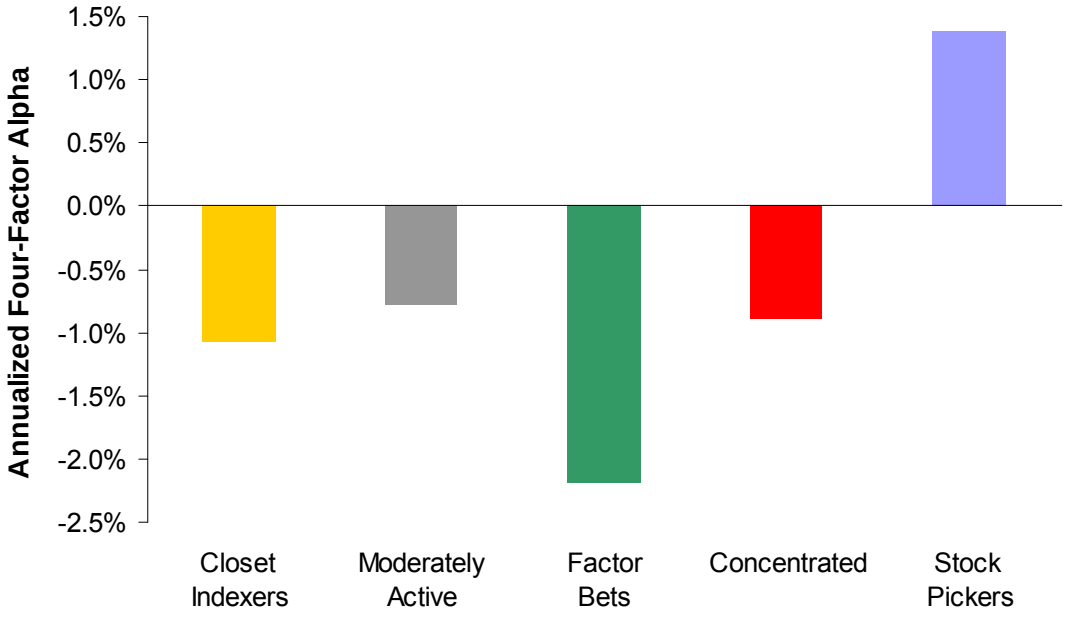
Seeking Portfolio Manager Skill

Active Share and Tracking Error as a Means to Anticipate Alpha



Source: Antti Petajisto, "Active Share and Mutual Fund Performance," *Working Paper,* December 15, 2010.

- **There is a logical case for active management, but the key challenge is identifying above-average portfolio managers ahead of time.**
- **Most statistics in the investment industry and corporate America fail the dual test of reliability and validity.**
- **Active share and tracking error are both reliable statistics, and research shows that funds with high active share and moderate tracking error deliver excess returns on average.**
- **The long-term trend has been toward lower active share, which makes it difficult for mutual funds to generate sufficient gross returns to offset fees.**

Equity markets are generally considered to be informationally efficient, which means that all relevant information is impounded in prices. Because it is difficult for an active manager to generate returns in excess of that of the market after an adjustment for risk, a common prescription is to turn to passive management in the form of index funds. This is a sensible approach for many investors. But the case for passive management has logical limits. For example, in economics there is an idea called the macro consistency test, which asks, "Would this approach work if *everyone* pursued it?" The answer for passive investing is no. Some percentage of investors *must* be active in order to ensure that information is translated into prices. Indeed, recent research shows that active management enhances, and passive management reduces, the informational efficiency of stock prices.[1]

In 1980, a pair of economists, Sanford Grossman and Joseph Stiglitz, wrote a seminal paper called, "On the Impossibility of Informationally Efficient Markets." [2] Their basic argument is that there is a cost to making sure that prices properly reflect information. If there is no return for obtaining and trading on information, there is no economic incentive to do so. They propose that "those who do expend resources to obtain information do receive compensation" in the form of excess returns. In-depth studies show that active managers do indeed generate gross returns in excess of those of the market. [3] However, those returns are less than the fees that managers charge. Careful studies of active management also reveal differential skill—that is, luck alone does not explain the results in investment management and a small percentage of managers deliver positive excess returns after all costs. [4]

Of course the challenge is to identify skillful managers *ex ante*. There are two major approaches to assessing manager skill. [5] The first relies on an analysis of prior returns. The effectiveness of this approach relies on extracting useful information about skill by considering a sufficiently long time period and by controlling for various factors, including the types of risks the manager has assumed and the systematic versus idiosyncratic risk exposure. Returns-based assessments rarely make sufficient and appropriate adjustments to distill skill from the reported results. Further, simulations show that even skillful managers—those endowed with an attractive *ex-ante* Sharpe ratio—can deliver poor returns for years as a consequence of luck. [6] In other words, even skillful managers won't always beat their benchmarks and unskillful managers can do well for stretches of time as the result of randomness.

The second approach to testing manager skill is look at the portfolio holdings and characteristics of managers. Characteristics might include a portfolio manager's age, education, and the size of his or her fund. The focus on portfolio construction and holdings allows for a more precise assessment of a manager's process. The focus of this discussion will be on active share, a concept developed by a pair of finance professors named Martijn Cremers and Antti Petajisto, as a means to increase the probability of identifying a skillful manager in advance. [7]

What Is the Characteristic of a Valuable Statistic?

The worlds of finance and investing are awash in statistics that purport to reflect what's going on. Statistics that are useful have two features: reliability and validity. [8] Reliability means that results are highly correlated from one period to the next. For example, a student who did poorly on a test last week does poorly this week, and the student who did well last week does well this week. High reliability and a large contribution of skill generally go together. Finance researchers use the term "persistence," which is the same as reliability.

The second feature is validity, which means the result is correlated with the desired outcome. For instance, say a baseball team's offensive goal is to score as many runs as possible. An analysis would show that on-base percentage is better correlated with run production than batting average is. So an enlightened manager would prefer on-base percentage to batting average as a statistic of offensive production, all else being equal.

The returns-based approach skips the two steps of reliability and validity and goes directly to the results. It doesn't pause to ask: what leads to excess returns? It just measures the outcome. This approach works in fields where skill determines results and luck is no big deal. For example, if you have five runners of disparate ability run a 100-yard dash, the outcome of the race is a highly reliable predictor of the next race. You don't need to know anything about the process because the result alone is proof of the difference in ability.

The difficulty with using a returns-based approach to assessing skill is that there is not a great deal of reliability, or persistence, in measures of excess returns. Researchers do find evidence for modest persistence but only when returns are carefully adjusted to account for style factors. [9] But correlations over short periods, say year-to-year, for alpha based on the capital asset pricing model (CAPM) are quite low.

This problem of low reliability applies broadly to any highly competitive field that is probabilistic. Results, and especially short-term results, cannot distinguish between a good process and a poor process because of the role of luck. So going directly to the results gives little indication about the quality of the decision-making process and the skill of the participant.

In contrast, the approach that considers the holdings and characteristics of the manager allows us to look at both reliability and validity. Now the discussion shifts a bit. The questions become: which measures of an active manager's portfolio reflect skill and therefore reliability? For example, a manager may be able to control the number of holdings, risk, turnover, and fees. Next, of the measures that are reliable, which are highly correlated with the ultimate objective of delivering excess returns? Are there measures that are both reliable and valid?

Active Share + Tracking Error = Indicator of Skill

Let's now take a closer look at active share. In plain language, active share is "the percentage of the fund's portfolio that differs from the fund's benchmark index." [10] Assuming no leverage or shorting, active share is 0 percent if the fund perfectly mimics the index and 100 percent if the fund is totally different than the index.

More technically,

$$\text{Active Share} = \frac{1}{2}\sum_{i=1}^{N}\left|\omega_{fund,i} - \omega_{index,i}\right|$$

where:
$\omega_{fund,i}$ = portfolio weight of asset *i* in the fund
$\omega_{index,i}$ = portfolio weight of asset *i* in the index

Here's a really simple example. Say the index has 10 stocks, weighted as follows:

Index Holdings

Position	Weight
Stock 1	20.0 %
Stock 2	15.0
Stock 3	12.0
Stock 4	11.0
Stock 5	10.0
Stock 6	9.0
Stock 7	8.0
Stock 8	7.0
Stock 9	5.0
Stock 10	3.0
Total	100.0

Now let's say we have a fund of 10 stocks, weighted as follows:

Fund Holdings

Position	Weight
Stock 1	10.0 %
Stock 2	0.0
Stock 3	5.0
Stock 4	3.0
Stock 5	20.0
Stock 11	15.0
Stock 12	12.0
Stock 13	11.0
Stock 14	9.0
Stock 15	15.0
Total	100.0

Active share is the sum of the absolute values of the difference between the weight in the index and the weight in the fund, divided by two:

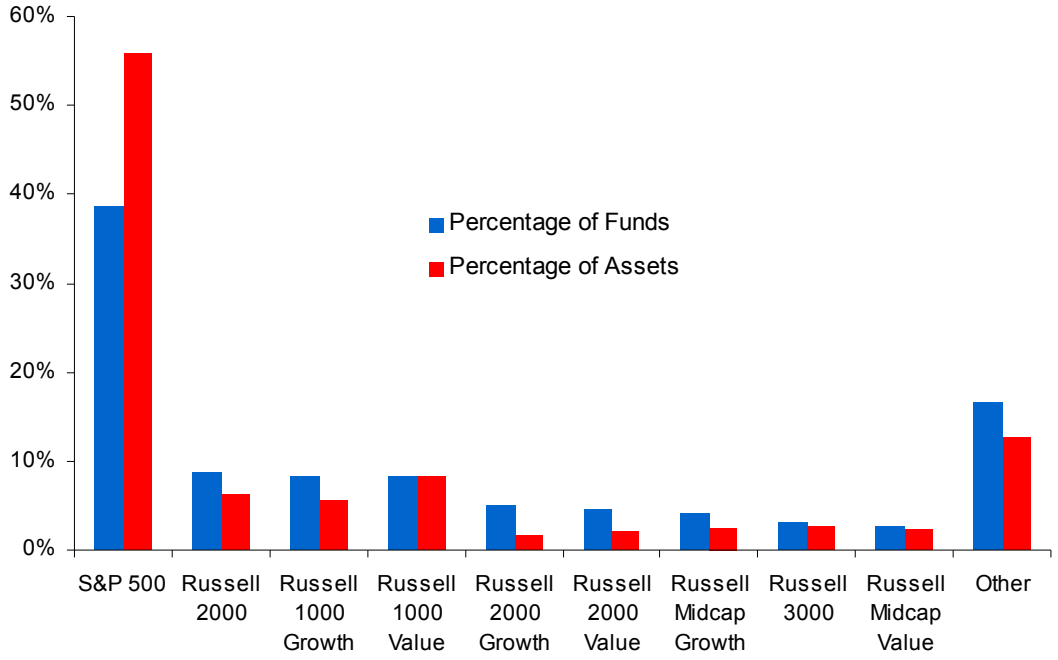
Position	Index Weight	Fund Weight	Active Share
Stock 1	20.0%	10.0%	5.0%
Stock 2	15.0	0.0	7.5
Stock 3	12.0	5.0	3.5
Stock 4	11.0	3.0	4.0
Stock 5	10.0	20.0	5.0
Stock 6	9.0	0.0	4.5
Stock 7	8.0	0.0	4.0
Stock 8	7.0	0.0	3.5
Stock 9	5.0	0.0	2.5
Stock 10	3.0	0.0	1.5
Stock 11	0.0	15.0	7.5
Stock 12	0.0	12.0	6.0
Stock 13	0.0	11.0	5.5
Stock 14	0.0	9.0	4.5
Stock 15	0.0	15.0	7.5
Total	100.0	100.0	72.0%

In this basic example, you can see that active share is the result of not owning, or weighting differently, the stocks in the index (see stocks 1-10) and owning stocks that are not in the index (see stocks 11-15).

Generally, an active share of 60 percent or less is considered to be closet indexing and active shares of 90 percent or more indicate managers who are truly picking stocks. For the past 30 years, active share has been declining steadily for the mutual fund universe in the United States. For instance, the percentage of assets under management with active share less than 60 percent went from 1.5 percent in 1980 to over 40 percent today.

The selection of an index as a benchmark is obviously crucial. Research by Antti Petajisto shows that of the roughly 2,500 mutual funds he analyzed, 38.6 percent used the S&P 500 as their benchmark. Weighted by assets, 56 percent of the funds use the S&P 500 as a benchmark. Other popular benchmarks include the Russell 2000 (8.8 percent by number, 6.2 percent by weight), the Russell 1000 Growth (8.4 percent by number, 5.6 percent by weight) and the Russell 1000 Value (8.2 percent by number, 8.4 percent by weight). Exhibit 1 shows the most common benchmark indexes.

Exhibit 1: Most Common Benchmark Indexes



Source: Antti Petajisto, "Active Share and Mutual Fund Performance," *Working Paper*, December 15, 2010.

There are two basic ways to raise active share. [11] The first is through stock selection, as our simple example shows. That means either buying stocks that are not represented in the index, or owning stocks that are in the index but at a position weight that is higher or lower than what is in the index.

The second way to raise active share is through systematic factor risk, which is effectively betting on factors by overweighting or underweighting industries. For example, a manager who is bullish on an economic recovery might overweight industries that are economically sensitive, or a manager who is bearish might overweight defensive industries. Tracking error, the standard deviation of the difference between the returns of the fund and of the index, does an effective job in capturing systematic factor risk. Tracking error puts more weight on correlated active bets than active share does. You can think of active share as a complement to tracking error and a measure that adds value in explaining fund results. A full picture of active management incorporates both active share and tracking error.

To illustrate the difference between these measures of active management, Petajisto offers the following illustration. Say a portfolio has 50 stocks. If all of the overweight positions are in technology stocks that move together, then small active positions will generate high tracking error. The portfolio has high systematic risk.

On the other hand, say the index represents 50 industries with 20 stocks in each industry and the fund selects one stock from each industry but weights that stock at the same level as the industry. In this case, active share will be high at about 95 percent but the tracking error will be relatively low. As Petajisto notes, "active share is a reasonable proxy for stock selection, whereas tracking error is a proxy for systematic factor risk."

There is a clear relationship between active share and tracking error. When active share is low, tracking error tends to be low and when active share is high, tracking error tends to be high. But the data show some amount of variation. For example, funds with tracking error of 4-6 percent can have active shares of 30 percent to 100 percent, while active shares in the 70-80 percent

range can be associated with tracking errors between 2 and 14 percent. This range of values for each measure of active management shows why it is important to distinguish between the two.

Exhibit 2 shows a matrix that classifies 401 mutual funds based on active share and tracking error using data from year-end 2007. The funds were sorted into quintiles based on each measure, with one as the lowest value and five as the highest value. The cells represent the number of funds that fall into the intersection of each pairing of quintiles. For example, if you examine the top right corner, you can see that 47 funds, or 11.6 percent of the sample, are in the highest quintile of *both* active share and tracking error. These are funds that are very different than their benchmarks and that have results that vary quite a bit from their benchmark. In contrast, the bottom left corner shows that nearly 15 percent of the sample—59 funds—are in the lowest quintile of both active share and tracking error. These are index hugging funds. To be in the top quintile, a fund must have an active share higher than 91 percent and a tracking error higher than 5.3 percent.

Exhibit 2: 401 Mutual Funds Ranked in Quintiles Based on Active Share and Tracking Error

		Tracking Error				
		1	**2**	**3**	**4**	**5**
Active Share	**5**	0	1	4	29	47
	4	1	8	22	23	26
	3	7	22	25	20	6
	2	13	34	24	7	2
	1	59	15	5	1	0

Source: Morningstar, FactSet, and LMCM analysis.

A common measure of portfolio performance is the information ratio, which is excess return divided by tracking error. There is a fairly linear relationship between large factor bets (i.e., the overweighting or underweighting of industries relative to the benchmark) and tracking error. So in order to have an attractive information ratio, those factor bets have to *really* pay off to compensate for the high tracking error. Broadly speaking, they don't. So active managers are better off maintaining high active share through stock picking than through sector bets.

The appendix provides a more sophisticated numerical example of active share and systematic factor bets based on a fictitious index and fund.

Active Share and Fees

The downward drift in active share raises an important issue in the active versus passive debate. If you're going to go passive, go passive. Buy a fund that charges low fees and closely mirrors the index. If you're going to go active, find a manager with a good process and high active share. Academic research shows, for example, that the best ideas of money managers generate excess returns. [12]

Active managers who have crept toward closet indexing have created a losing proposition—market-like returns accompanied by fees higher than index funds. Petajisto provides an interesting case with Fidelity's flagship mutual fund, Magellan. Peter Lynch made the fund famous by delivering outstanding returns in the 1980s when he managed it, in part by sustaining high active share. When Jeffrey Vinik ran the fund in the early 1990s, it had an active share above 70 percent. However, the fund's next manager, Robert Stansky, who took over in 1996, took the active share below 40 percent and kept it there for a half dozen years.

Here's why it's so hard to beat the market with low active share and an average expense ratio. Say a fund has an expense ratio of 125 basis points—roughly the average of all funds in Petajisto's study—and the active share is 33 percent. That means that two-thirds of the portfolio

is earning the same return as the benchmark index. Therefore, the active part has to make up for the difference with massive outperformance. For example, in order to equal the benchmark's returns, the active portion needs to earn an excess return of 375 basis points:

	Percentage of Portfolio	Excess Return	Weighted Return
Passive	67%	0.00%	0.00%
Active	33	3.75	1.25%
	100%		
Gross return			1.25%
Less expenses			-1.25%
Net return			= 0%

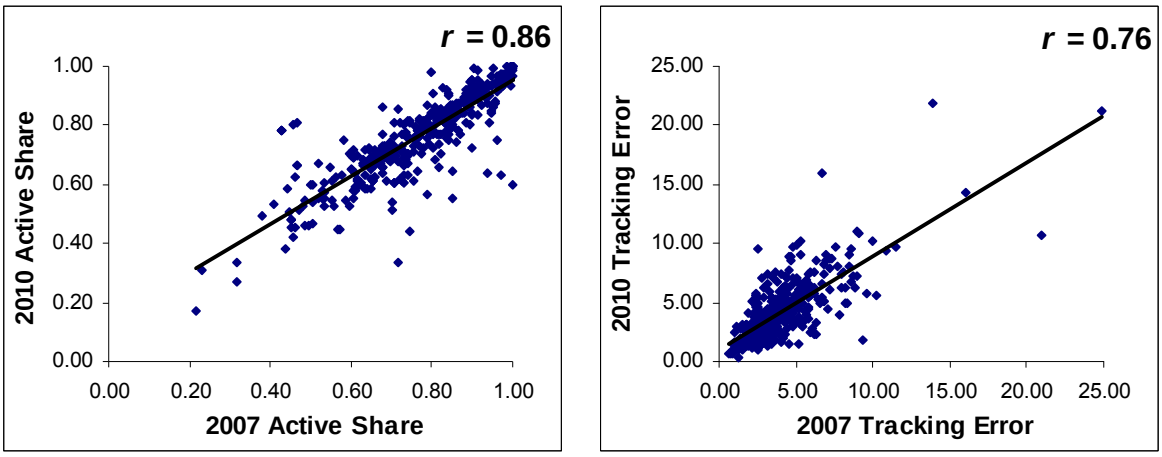
Petajisto did find that low active share funds tended to have lower expense ratios, but the fees were sufficient to make outperformance extremely difficult. Generating excess returns is challenging enough, but low active share and average fees make the task even more daunting.

Reliability and Validity

We noted before that the returns-based approach to assessing skill skips the steps of reliability and validity. Now we apply the features of a useful statistic to active share and tracking error. The way to test reliability in this case is to examine the coefficient of correlation, *r*, between the active share for the same fund over two different time periods. Using a sample of approximately 400 mutual funds, the *r* between active share for 2007 and 2010 is 86 percent. (See exhibit 3, left side.) Cremers and Petajisto also found active share to be reliable. This makes sense, because active share is within the control of a portfolio manager.

Tracking error, too, appears to have good reliability. For the same funds and same time period, the coefficient of correlation, *r,* is 76 percent. (See exhibit 3, right side.) To put these figures in context, three-year alphas based on the CAPM have a coefficient of correlation of close to zero.

Exhibit 3: Reliability of Active Share and Tracking Error



Source: Morningstar, FactSet, and LMCM analysis.

The second feature of a useful statistic is validity—it leads you to the outcomes that you seek. The research suggests that high active share is desirable if it is the result of stock picking, but less desirable if it is the result of factor bets that show up as high tracking error. Petajisto sorts 1,124 funds into five categories based on results from 1990 through 2009 (see exhibit 4). Stock pickers are in the highest quintile of active share, but in the bottom 80 percent of tracking error

within that active share quintile. He labels "concentrated" the funds in the highest quintile of active share that have the highest tracking error. These funds have high systematic factor risk. Funds in the stock pickers category have an average active share of 97 percent with an average tracking error of 8.5 percent. The concentrated funds have similar active share, at 98 percent, but have a tracking error of 15.8 percent, which is almost double that of the stock pickers.

Exhibit 4: Fund Categories and Their Statistics (5 = Top, 1 = Bottom)

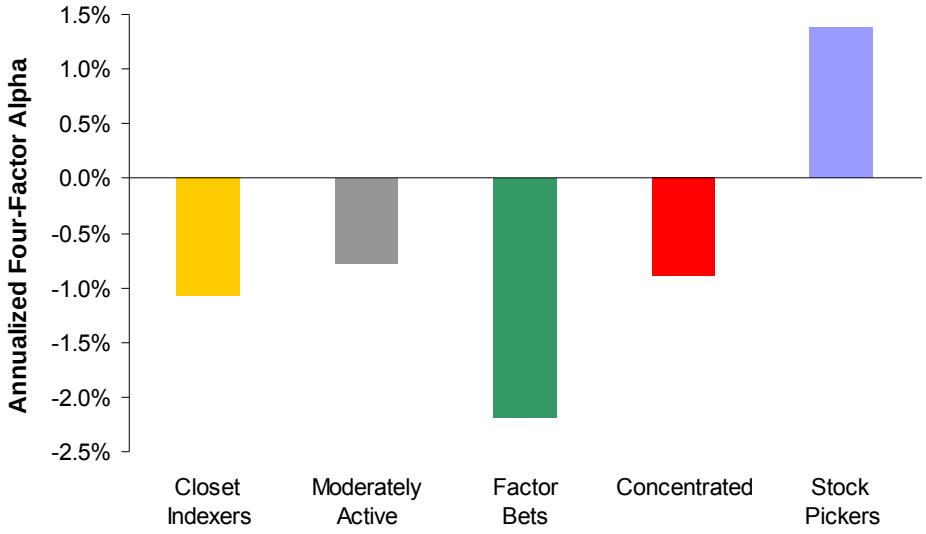
Label	Description	Average Active Share	Average Tracking Error	Portfolio Turnover	Number of stocks	Average Expense Ratio
Stock pickers	Top quintile AS, quintiles 1-4 TE	97%	8.5%	83%	66	1.41%
Concentrated	Top quintile AS, top quintile TE	98%	15.8%	122%	59	1.60%
Factor bets	Quintiles 2-4 AS, top quintile TE	79%	10.4%	104%	107	1.34%
Moderately active	Quintiles 2-4 AS, quintiles 1-4 TE	83%	5.9%	84%	100	1.25%
Closet indexers	Bottom quintile AS, quintiles 1-4 TE	59%	3.5%	69%	161	1.05%

Source: Antti Petajisto, "Active Share and Mutual Fund Performance," *Working Paper*, December 15, 2010.

Funds that make relatively large factor bets are in the bottom four quintiles for active share but have among the highest tracking error within those quintiles. Moderately active funds are in the middle quintiles for active share but have tracking error that is much lower than the funds making factor bets. Finally, the closet indexers have low active share and low tracking error.

The test of validity is whether these categories correlate with excess returns. Exhibit 5 shows the results from Petajisto's research. Importantly, these results include a period when large capitalization stocks did well (the 1990s), small capitalization stocks outperformed (the 2000s), and the financial crisis. Petajisto shows that stock pickers generate annual alpha of 1.39 percent, whereas all of the other categories have negative alpha. The funds that rely on factor bets are the worst performing category. However, funds with high tracking error and high active share perform less poorly.

Exhibit 5: Four-Factor Alpha for 1,124 Funds from 1990-2009 Based on Fund Category



Source: Antti Petajisto, "Active Share and Mutual Fund Performance," *Working Paper*, December 15, 2010.

Petajisto's large sample over 20 years provides a solid basis to establish validity. The smaller sample we used to establish reliability provided similar results. The funds that were in the highest quintile for active share and the bottom 80 percent of tracking error—64 funds altogether—generated annualized alpha of 3.8 percentage points from 2008-2010, well in excess of the results of the sample of all 400 funds.

The conclusion is that a thoughtful combination of active share and tracking error reflects the essential features of a good statistic: they are reliable and valid. Still, active share needs additional testing before it can be declared sufficient to indicate *ex ante* skill. One specific concern is benchmark selection. Small capitalization funds, for instance, tend to have higher active share than large capitalization funds. This is because small capitalization indexes have more stocks, with a lower average weight, than large capitalization indexes do. So the favorable results from the analysis of active share may stem in part from the fact that small capitalization funds beat their indexes more often than large capitalization funds do.[13]

Summary

Investment management is a very competitive business, in part because there are so many bright and motivated people seeking to beat their benchmarks. As a result, randomness plays a large role in determining results in the short term and it is difficult to deliver excess returns over time. Still, academic research shows that some funds do better than chance would suggest, and that active managers beat their benchmarks before fees. The fundamental question is whether funds with a good chance of outperforming their benchmark can be identified in advance.

There are two approaches to assessing managers. The first examines past results. This approach can reveal information if the track record is sufficiently long and enough controls are put into place so as to ensure that the results are not the consequence of risk. But relying on results in any domain that is based on probability is inherently troublesome, because the challenge of sorting skill and randomness is daunting.

The second approach studies the characteristics and behavior of the manager in order to assess whether he or she has a good process. To be useful, any measure of performance must have two features: reliability and validity. Most manager assessments use statistics that are neither reliable nor valid. We argue that a combination of active share and tracking error provides a glimpse into process. Taken together, these statistics are also reliable and valid. Based on this discussion, we can arrive at four conclusions:

- *There is a role for active management*. Having some active managers is a logical necessity. Research shows that active management increases the informational efficiency of stock prices and that passive management makes prices less efficient. The key challenge is identifying above-average managers ahead of time.
- *Reliability and validity.* Most statistics in the investment industry fail the dual test of reliability and validity. This is true in corporate America as well. As a consequence, it's important to break down investment results further in order to get a better handle on potential skill.
- *The combination of active share and tracking error provides insight.* Active share and tracking error are both reliable statistics. For example, for 400 mutual funds (2007 to 2010) the coefficient of correlation for active share was 86 percent while tracking error was 76 percent. In seeking validity, the goal is to identify funds with high active share (top quintile) that are not in the highest quintile for tracking error. High tracking error indicates sizeable factor bets, which tend to deliver poor returns. Research by Cremers and Petajisto, confirmed by our own smaller sample, shows that funds with high active share and moderate tracking error deliver excess returns.
- *There is a long-term trend toward lower active share.* The percentage of assets under management with active share below 60 percent—considered to be closet indexing—has risen from 1.5 percent 30 years ago to more than 40 percent today. Passive management makes sense for a great deal of investors. But the essential message is this: If you're going to be active, go active. Don't own a fund with low active share, because the chances are good that the fund's gross returns will be insufficient to leave you with attractive returns after fees.

I'd like to acknowledge the intellectual contribution of Arturo Rodriguez, CFA. As always, Dan Callahan, CFA, added great value in all aspects of preparing this piece.

Endnotes:

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[2] Sanford J. Grossman and Joseph E. Stiglitz, "On the Impossibility of Informationally Efficient Markets," *American Economic Review*, Vol. 70, No. 3, June 1980, 393-408.
[3] Russ Wermers, "Mutual Fund Performance: An Empirical Decomposition into Stock-Picking Talent, Style, Transaction Costs, and Expenses," *Journal of Finance*, Vol. 55, No. 4, August 2000, 1655-1695.
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[5] Russ Wermers, "Performance Measurement of Mutual Funds, Hedge Funds, and Institutional Accounts," *Annual Review of Financial Economics,* Vol. 3, 2011, 537-574.
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[9] The most widely used are Carhart's four-factor model (CAPM, size, valuation, momentum) and the Fama-French three-factor model (CAPM, size, valuation). See Mark M. Carhart, "On Persistence in Mutual Fund Performance," *Journal of Finance*, Vol. 52, No. 1, March 1997, 57-82 and Eugene F. Fama and Kenneth R. French, "Common Risk Factors in the Returns of Stocks and Bonds," *Journal of Financial Economics*, Vol. 33, No. 1, February 1993, 3-56.
[10] Antti Petajisto, "Active Share and Mutual Fund Performance," *Working Paper,* December 15, 2010.
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[13] Robert C. Jones, CFA, and Russ Wermers, "Active Management in a Mostly Efficient Market," *Financial Analysts Journal*, Vol. 67, No. 6, November/December 2011, 29-45.

Appendix: Decomposing Active Share

On the left is a fictitious index. The list shows the 50 stocks in the index, which industry each company is in, and the weight within the index. On the right is our fictitious fund, which has 25 stocks. Note that the stocks in the fund do not overlap completely with the stocks in the index. In other words, the fund holds some stocks that are not in the index.

Index Holdings	Weight
Energy Company 6	7.7%
Information Technology Company 1	7.2%
Information Technology Company 4	4.1%
Energy Company 3	4.0%
Information Technology Company 6	3.7%
Industrials Company 3	3.6%
Consumer Staples Company 4	3.5%
Telecommunication Services Company 4	3.4%
Health Care Company 3	3.4%
Health Care Company 5	3.2%
Information Technology Company 3	3.1%
Consumer Staples Company 2	3.0%
Financials Company 7	2.8%
Consumer Staples Company 5	2.6%
Financials Company 2	2.6%
Financials Company 4	2.4%
Information Technology Company 5	2.3%
Health Care Company 4	2.2%
Telecommunication Services Company 5	2.2%
Consumer Staples Company 6	2.0%
Consumer Staples Company 3	2.0%
Consumer Discretionary Company 7	2.0%
Energy Company 2	1.8%
Energy Company 5	1.7%
Health Care Company 1	1.7%
Financials Company 3	1.5%
Energy Company 4	1.4%
Industrials Company 5	1.3%
Consumer Discretionary Company 3	1.3%
Industrials Company 6	1.3%
Consumer Discretionary Company 5	1.2%
Consumer Discretionary Company 2	1.2%
Consumer Discretionary Company 1	1.2%
Health Care Company 2	1.1%
Industrials Company 2	1.1%
Industrials Company 4	1.1%
Financials Company 1	1.1%
Materials Company 1	0.8%
Utilities Company 6	0.8%
Materials Company 4	0.7%
Materials Company 3	0.7%
Materials Company 2	0.6%
Materials Company 6	0.6%
Utilities Company 2	0.6%
Utilities Company 3	0.6%
Utilities Company 4	0.5%
Utilities Company 5	0.5%
Telecommunication Services Company 1	0.4%
Telecommunication Services Company 3	0.1%
Telecommunication Services Company 6	0.1%
Total	100.0%

Fund Holdings	Weight
Consumer Discretionary Company 1	7.7%
Consumer Staples Company 1	7.1%
Information Technology Company 5	7.0%
Energy Company 4	6.2%
Consumer Staples Company 3	6.0%
Information Technology Company 7	5.2%
Consumer Discretionary Company 4	5.0%
Health Care Company 6	5.0%
Financials Company 6	4.9%
Financials Company 5	4.7%
Energy Company 1	4.7%
Telecommunication Services Company 2	4.1%
Industrials Company 4	4.0%
Financials Company 1	4.0%
Industrials Company 1	3.8%
Information Technology Company 8	3.4%
Materials Company 7	2.4%
Materials Company 6	2.3%
Information Technology Company 2	2.2%
Health Care Company 2	2.2%
Materials Company 5	2.1%
Utilities Company 5	1.8%
Consumer Discretionary Company 6	1.5%
Utilities Company 1	1.4%
Telecommunication Services Company 6	1.3%
Total	100.0%

The table below shows the calculation of active share by placing the index and the fund next to one another. This fund has an active share of 88.5 percent. On the left you can see how active share rises as the result of stock picking. The fund doesn't hold some of the stocks that are the index's largest weighting and does hold stocks that are not in the index.

On the right is the active share as the result of sector weights (tracking error captures this well). Naturally, active share is a blend of stock picking and sector bets. These amounts are related. In general, high active share via stock picking and relatively low active share via sector bets does best.

Total Active Share

Holdings	Weight in Index	Weight in Fund	Active Share
Energy Company 6	7.7%	0.0%	3.9%
Information Technology Company 1	7.2%	0.0%	3.6%
Information Technology Company 4	4.1%	0.0%	2.1%
Energy Company 3	4.0%	0.0%	2.0%
Information Technology Company 6	3.7%	0.0%	1.8%
Industrials Company 3	3.6%	0.0%	1.8%
Consumer Staples Company 4	3.5%	0.0%	1.7%
Telecommunication Services Company 4	3.4%	0.0%	1.7%
Health Care Company 3	3.4%	0.0%	1.7%
Health Care Company 5	3.2%	0.0%	1.6%
Information Technology Company 3	3.1%	0.0%	1.6%
Consumer Staples Company 2	3.0%	0.0%	1.5%
Financials Company 7	2.8%	0.0%	1.4%
Consumer Staples Company 5	2.6%	0.0%	1.3%
Financials Company 2	2.6%	0.0%	1.3%
Financials Company 4	2.4%	0.0%	1.2%
Information Technology Company 5	2.3%	7.0%	2.3%
Health Care Company 4	2.2%	0.0%	1.1%
Telecommunication Services Company 5	2.2%	0.0%	1.1%
Consumer Staples Company 6	2.0%	0.0%	1.0%
Consumer Staples Company 3	2.0%	6.0%	2.0%
Consumer Discretionary Company 7	2.0%	0.0%	1.0%
Energy Company 2	1.8%	0.0%	0.9%
Energy Company 5	1.7%	0.0%	0.9%
Health Care Company 1	1.7%	0.0%	0.8%
Financials Company 3	1.5%	0.0%	0.7%
Energy Company 4	1.4%	6.2%	2.4%
Industrials Company 5	1.3%	0.0%	0.7%
Consumer Discretionary Company 3	1.3%	0.0%	0.6%
Industrials Company 6	1.3%	0.0%	0.6%
Consumer Discretionary Company 5	1.2%	0.0%	0.6%
Consumer Discretionary Company 2	1.2%	0.0%	0.6%
Consumer Discretionary Company 1	1.2%	7.7%	3.3%
Health Care Company 2	1.1%	2.2%	0.5%
Industrials Company 2	1.1%	0.0%	0.6%
Industrials Company 4	1.1%	4.0%	1.5%
Financials Company 1	1.1%	4.0%	1.5%
Materials Company 1	0.8%	0.0%	0.4%
Utilities Company 6	0.8%	0.0%	0.4%
Materials Company 4	0.7%	0.0%	0.4%
Materials Company 3	0.7%	0.0%	0.3%
Materials Company 2	0.6%	0.0%	0.3%
Materials Company 6	0.6%	2.3%	0.8%
Utilities Company 2	0.6%	0.0%	0.3%
Utilities Company 3	0.6%	0.0%	0.3%
Utilities Company 4	0.5%	0.0%	0.3%
Utilities Company 5	0.5%	1.8%	0.7%
Telecommunication Services Company 1	0.4%	0.0%	0.2%
Telecommunication Services Company 3	0.1%	0.0%	0.1%
Telecommunication Services Company 6	0.1%	1.3%	0.6%
Utilities Company 1	0.0%	1.4%	0.7%
Energy Company 1	0.0%	4.7%	2.3%
Information Technology Company 2	0.0%	2.2%	1.1%
Industrials Company 1	0.0%	3.8%	1.9%
Consumer Discretionary Company 4	0.0%	5.0%	2.5%
Telecommunication Services Company 2	0.0%	4.1%	2.1%
Consumer Staples Company 1	0.0%	7.1%	3.6%
Consumer Discretionary Company 6	0.0%	1.5%	0.8%
Materials Company 5	0.0%	2.1%	1.0%
Information Technology Company 7	0.0%	5.2%	2.6%
Materials Company 7	0.0%	2.4%	1.2%
Information Technology Company 8	0.0%	3.4%	1.7%
Financials Company 5	0.0%	4.7%	2.4%
Health Care Company 6	0.0%	5.0%	2.5%
Financials Company 6	0.0%	4.9%	2.5%
Total	100.0%	100.0%	88.5%

Sector Active Share

Sectors	Weight in Index	Weight in Fund	Active Share
Energy	16.8%	10.9%	3.0%
Materials	3.4%	6.7%	1.7%
Industrials	8.4%	7.9%	0.3%
Consumer Discretionary	6.9%	14.3%	3.7%
Consumer Staples	13.1%	13.1%	0.0%
Health Care	11.6%	7.2%	2.2%
Financials	10.3%	13.6%	1.7%
Information Technology	20.4%	17.8%	1.3%
Telecommunication Services	6.3%	5.4%	0.4%
Utilities	2.9%	3.2%	0.1%
Total	100.0%	100.0%	14.3%

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