

Mesirow Financial Investment Strategies: PrecisionAlpha™ Manager Analysis



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INTRODUCTION

Alpha is defined as the return on an investment in excess of what would be explained by a model or benchmark. The most common method for calculating alpha is to compare the return of the investment to a popular benchmark such as the S&P 500 Index or Lehman Brothers Aggregate Bond Index. While this provides a simple measurement of manager performance relative to a benchmark, it is not a reliable way to estimate what is sometimes called the “true” alpha.

For example, if one has an investment that returns 25 percent, and in the same period the S&P 500 Index returns only 10 percent, it would appear that the manager added 15 percent in alpha. Although the arithmetic is easy enough, this method for calculating alpha can give investors the wrong impression about a manager. Just because a manager is measured by a popular benchmark doesn’t mean that benchmark alone is appropriate, nor are the risks the manager took measured by the simple difference with the benchmark return.

A better estimate of the “true” alpha is the return in excess of a customized benchmark, constructed from an appropriate set of benchmarks based on the manager’s historical style, and represents a measure of the value added due to a manager’s skill. In other words, a manager should not be rewarded for performance that can be achieved by investing in the (customized) benchmark, which is exactly the same as using index funds to implement a long-term strategic asset allocation.

While it is not always obvious, especially when many asset classes are involved, investing in fixed combination of benchmarks is no different from investing in a single benchmark. The intuition behind using a single popular benchmark like the S&P 500 is clearer, but either way, investing in the benchmark is investing in “the market”.

Many factors, including the risk taken by the manager and the appropriateness and accuracy of the benchmark, should be analyzed to ensure that a manager is not rewarded or punished for the return of the market, and that he is grouped into the correct asset class. Judging a manager’s performance relative to true peers is as crucial a component in identifying skilled managers as is the calculation of alpha itself.



TRADITIONAL APPROACH TO ALPHA

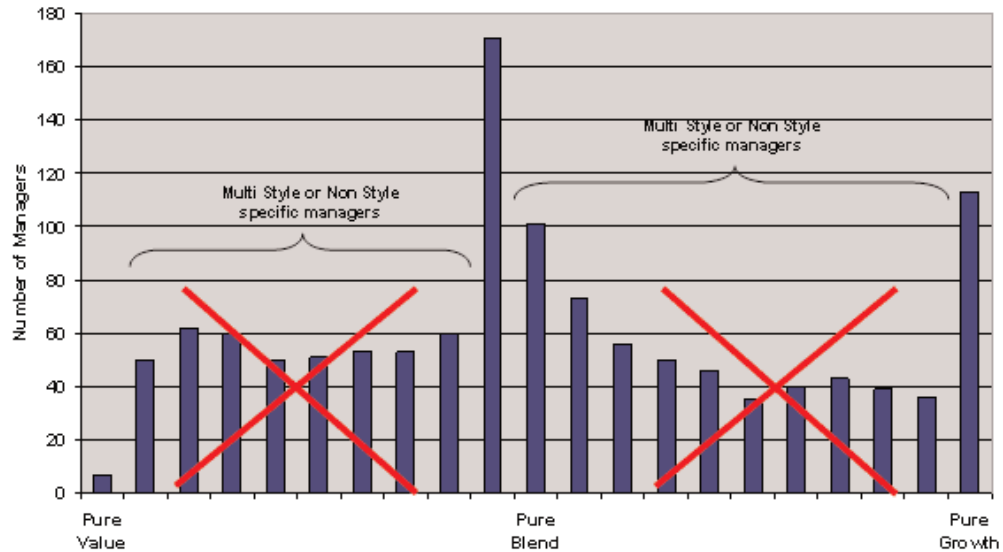
When examining traditional methods of measuring alpha using Returns-Based Style Analysis (RBSA) from a statistical point of view, we notice three general shortcomings.

- Managers following style-pure strategies often fail to be peer grouped properly, and managers using multi-style strategies may fail to be peer grouped at all.
- Failure to account for the error around estimating the asset class exposure and excess return measurement, or alpha, of a manager’s strategy.
- As a consequence of the above shortcomings, managers with mediocre performance risk being ranked highly within a given peer group, because (1) they are misclassified by style into the wrong peer group; (2) an inappropriate benchmark is used to calculate alpha; and (3) there may be little confidence in precision of the alpha measure.

The traditional approach relies on the R-Squared, which is a measure of how well RBSA explains the strategy’s returns. The R-Squared measurement will become inflated as additional variables are included, regardless of how well these new variables explain the regression, and often the explanatory variables themselves are highly correlated. This combination of a high R-Squared and a set of highly correlated benchmarks can lead to the *appearance* of accuracy in explaining a manager’s performance, when in fact the manager could be peer grouped improperly and alpha measured inaccurately, based on RBSA selecting benchmarks highly correlated with the true (appropriate) benchmark.

The peer grouping process typically uses a single long term regression or a rolling period analysis and requires a high exposure to a single asset class. Including only a single or rolling analysis can fail to capture the subtleties of a manager’s strategy and the requirement of exposure to a single asset class can cause many skilled managers to be excluded from further analysis.

Peer Grouped using a Single 60 Month RBSA with a Russell 4 Corner Benchmark Set and a regular R-squared



Source: Mesirow Financial Investment Strategies

A traditional calculation of alpha and asset class exposures can be unstable across time, with managers that are improperly peer grouped or that have experienced stellar performance by getting lucky with a few securities shown as top managers, while they may in fact not possess the true skill that a long term manager search strives to identify.

The traditional alpha measure does not account for the high estimation error in the performance measurement process. Consider an investor choosing between the following two active managers:

	Alpha (Excess Return)	Active Risk
Manager 1	2.00%	5.00%
Manager 2	2.00%	5.00%

Based on the above analysis, the investor would be indifferent to investing with either manager. Both offer identical alpha with the same degree of active risk or tracking error. A problem with this scenario is that the investor is missing a key piece of information about the estimation of each manager’s alpha. When estimating the performance of a manager, there is a wide margin of error associated with that estimation. Consider the following:

	Alpha (Excess Return)	Active Risk	Error Term
Manager 1	2.00%	5.00%	1.00%
Manager 2	2.00%	5.00%	10.00%



By ignoring this estimation error in alpha, an investor is oblivious to the fact that while the alpha and active risk are identical for the two managers, the estimation error associated with Manager 1 is 1 percent and the error associated with Manager 2 is 10 percent. This provides more information that allows us to conclude that Manager 1 is significantly more likely than Manager 2 to possess real skill, as measured by a positive alpha that is statistically different from zero, though traditional methods would ignore this fact.

THE PRECISIONALPHA™ PROCESS

One is able to get a more precise measurement of alpha by adding more information to the process and accounting for the estimation error of the statistic. Mesirow Financial's PrecisionAlpha™ process identifies funds that have been consistent performers in the past and are the best candidates to be alpha generators over the next 12 to 24 months. The logic behind the process is that by more accurately assessing the true skill of an investment manager, we can distinguish between luck and skill among good past performers, and thereby identify managers with an increased likelihood of performing well in the future.

At the core of our process is the use of several different variations of RBSA to identify the most appropriate style-adjusted benchmark for each individual strategy. PrecisionAlpha™ is a multi-tiered mathematical framework to provide an estimate of a manager's skill in generating returns that stand the best chance of outperforming the benchmark in the future. The process is divided into three important phases:

1. Precision-Weighted Peer Grouping and Alpha Measurement
2. Significance-Weighted Bayesian Performance Evaluation
3. Bayesian Peer Group Shrinkage.

Phase One: Precision Weighted Peer Grouping and Alpha Measurement

OVERVIEW

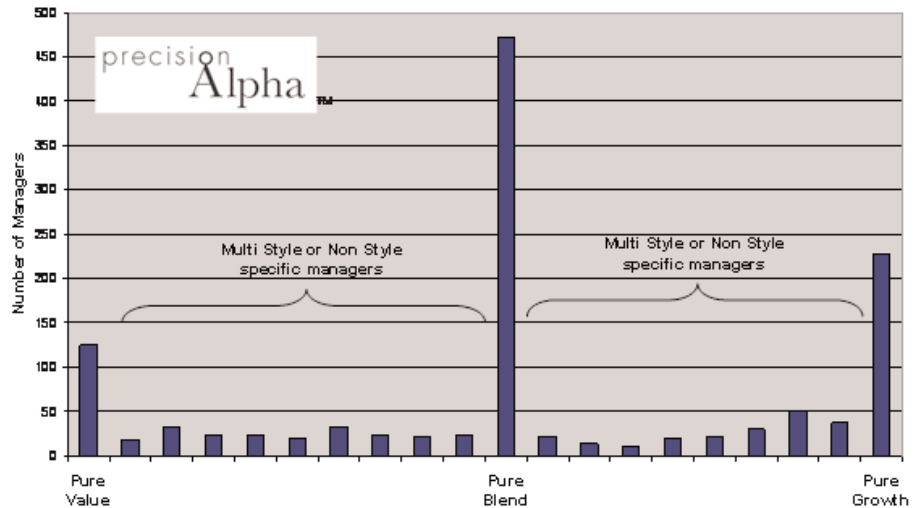
The PrecisionAlpha™ method begins by performing RBSA on all the investment options within the universe. Careful interpretation of the results will divide the U.S. Equity market into pure capitalization (Large, Mid, Small), and pure style (Value, Core, Growth). The method used to group managers is based on a weighting of two variations of RBSA.

The first is a single-period Adjusted R-Squared analysis, which systematically removes benchmarks from the model for each individual manager to find the benchmark subset that provides highest R-Squared measure with the fewest number of benchmarks. The second method uses the same Adjusted R-Squared, but the alpha statistic and the betas associated with it are calculated on a rolling time period basis. One of the benefits of using the Adjusted R-squared rather than the regular R-Squared is that it directly attempts to choose the model with the optimal tradeoff between the fit of the model and the complexity. It also selects from among potentially highly correlated benchmarks within the set, and in general retains the "correct" benchmark (the one that contributes the most to R-Squared individually) rather than its correlated alternatives. The smaller set of the most appropriate benchmarks enhances the accuracy of the remaining benchmark weights (the betas), because no weight is assigned to benchmarks that either makes minor contributions to the explanatory power of the model or are highly correlated with the "correct" benchmarks.

The statistical precision of the single and rolling period analyses, as well as the correlations among each rolling window, are used to combine the results of the two variations of RBSA. The result is a precision-weighted peer group assignment and a precision-weighted alpha calculation that consistently combine long-term manager style and performance with rolling shorter-term performance, thereby accounting for both style-consistent and dynamic, multi-style manager strategies.



**Peer Grouped using a Rolling Period RBSA with a set of 9 Russell
Benchmarks and an Adjusted R-squared**



Source: Mesirow Financial Investment Strategies

STYLE-PURE STRATEGIES VS. MULTI-STYLE STRATEGIES

Many managers employ investment strategies that trade across several different capitalizations as well as style categories. Some investment managers are able to generate alpha by not restricting the investment universe in capitalization size. This should prevent a manager from being pigeon-holed as a large-cap growth or small-cap value strategy. It is these investment managers that have demonstrated superior stock selection and/or investment research and analysis that are often overlooked by many methods of returns-based style analysis peer grouping. Restricting the selection of managers that may be concentrated in small-cap stocks, but employ a mandate that allows for the inclusion of higher-cap securities if the proprietary research shows that the security should be purchased, causes many managers that have historically generated alpha to be purged from the selection universe and investors may miss out on these alpha hunting strategies.

Funds that are defined in a U.S. equity peer group but do not meet the pure style analysis criteria in one particular asset class or style are not removed at this point in the PrecisionAlpha™ process. Instead, style-pure managers are analyzed separately from multi-style managers within each of the nine U.S. equity style boxes. Even for multi-style strategies, the Adjusted R-Squared analysis generally results in a handful of dominant asset class benchmarks (2 to 4) in which these managers are focused. The PrecisionAlpha™ measure that is calculated is based on these major asset class betas to account for the manager investing across different capitalizations or styles.

COMPLETION PORTFOLIO FOR MULTI-STYLE MANAGERS

Including both style-pure and multi-style strategies in the selection universe enables an investor to choose a manager who uses research to select securities regardless of style or cap size. On a strategy-by-strategy basis, this can prove to add much value to performance. An investor’s portfolio, on the other hand, should ultimately be well diversified and not have any real style biases. When a multi-style strategy is used in a portfolio, a passive strategy can be employed to effectively neutralize the style bets that an active manager has taken. A passive strategy is designed to track a certain benchmark rather than outperform it, and including passive investment options in the universe allows us to create a “completion fund” to fill in a strategic asset allocation *around* a set of alpha-seeking, multi-style managers. As the asset class exposures of the multi-style manager changes over time, the investments within the completion fund are rebalanced to maintain the overall strategic allocation without creating unnecessary turnover in the active portion of the portfolio. Alternatively, style-pure managers within less efficient asset classes can be used in place of passive investments in the completion fund, and provide additional opportunity for superior portfolio performance.



While the PrecisionAlpha™ process allows for the inclusion of style-pure and multi-style strategies, one important criterion for selecting a manager is the consistency of the strategy. Performing analysis on an investment strategy in order to define the asset class and style concentration is useful, but if that asset class and style concentration is not consistent from quarter-to-quarter or year-over-year, we will not maintain exposure to the asset class that we intended. For this reason, the PrecisionAlpha™ process takes into account the rolling distribution of the RBSA coefficients, and we examine a measure of the style consistency to style-pure managers. Similarly, if a multi-style strategy shows a high exposure to two dominant benchmarks, we would ideally want to see the exposure to those two asset classes consistent throughout the rolling period, although the desired level will be less restrictive than that required for style-pure managers.

Phase Two: Significance-Weighted Bayesian Performance Evaluation

The second phase of the PrecisionAlpha™ process involves a Bayesian performance measurement and beliefs about a manager's skill. RBSA is designed to explain a manager's performance based on movements in the market benchmarks. Any performance that is not explained by these movements can be attributed to a manager's skill. By using the Adjusted R-Squared measure outlined in Phase One, we make an attempt to explain as much of the manager's performance as possible, which reduces any "noise" or performance falsely identified as being generated by skill. This measurement of a manager's skill is based solely on statistical data.

To enhance the precision of the alpha estimate, a level of confidence in manager skill is determined based on the statistical confidence that the Phase One alpha is significantly different from zero, so that no qualitative judgments are required. This confidence level is used in a significance-weighted, Bayesian average of skilled and unskilled alpha estimates. When we assume a manager has no real skill, the alpha estimate is based only on manager fees rather than any actual manager performance. For the skilled alpha estimate, research by Baks, Metrick, and Wachter (BMW)¹ provides a formula for determining the expected mean of alpha based on the probability density and cumulative probability density of a Student's t distribution. One of the challenges with the BMW analysis is that it is only valid for unconstrained Ordinary Least Squares regression, whereas RBSA requires the constraints that all of the exposures to benchmarks be positive and sum to one. This requires an extensive modification of the BMW analysis, in which the constraints are imposed via a Dirac delta function represented as the limit of a Gaussian distribution, a mathematical technique common in theoretical physics.

Phase Three: Bayesian Peer Group Shrinkage

Now that we have calculated a PrecisionAlpha™ statistic for each investment manager, we must adjust the statistic based on the alpha generated by the population of investment managers who are running similar strategies. Each investment strategy has been assigned to a specific peer group based on RBSA and a PrecisionAlpha™ measure has been calculated. By taking the mean of the Phase Two PrecisionAlpha™ statistics in each peer group, we arrive at the average PrecisionAlpha™ statistic for every peer group, or the average excess return for a manager using a specific strategy. This is another reason the peer grouping process in Phase One is so crucial.

When investment strategies are grouped correctly, research by Jones and Shanken (JS)² demonstrates a phenomenon known as "learning across funds." Conceptually, managers within a peer group can be viewed as individual draws or samples from a distribution of managers with similar characteristics. In a Bayesian framework, accounting for this phenomenon results in "group shrinkage", in which the statistical parameter estimates for the individual constituents of a population are pulled toward the mean of the population, via a precision-weighted average of the individual and group statistics.

¹Source: Baks, Klaas P., Andrew Metrick, and Jessica Wachter, 2001. Should Investors Avoid All Actively Managed Mutual Funds? A Study in Bayesian Performance Evaluation, *Journal of Finance* 51, 45-85.

²Source: Jones, Christopher S. and Jay Shanken, 2005. Mutual Fund Performance with Learning Across funds, *Journal of Financial Economics* 78, 507-552.

Many similar methods use the assumption that the mean alpha of a peer group is equal to zero after adjusting for fees. In practice, while the mean alpha of a peer group is often close to zero, it is not always equal, especially in the less efficient asset classes. The PrecisionAlpha™ process uses the actual mean of alpha in each peer group, as opposed to an assumption theoretically founded on the behavior of the entire universe of active managers that is not always accurate for peer group subsets.

Using the tracking error of each individual investment manager and the group average tracking error, we calculate a Bayesian precision-weighted average of the individual manager Phase Two alpha estimates and the peer group average. This method tends to make the individual manager's alpha more precise. In effect, the additional information contained in the group averages adjusts the individual alpha estimate closer to its "true" but unknowable value, and improve its statistical error in the process. The resulting Phase Three PrecisionAlpha™ statistic is forward looking, and attempts to distinguish managers with true skill who stand the best chance of outperforming their peers in the next 12 to 24 months.

SUMMARY

The intent of the PrecisionAlpha™ process is not to reinvent the manager selection wheel, but to allow for a smoother ride by reducing the bumps in the road.

- By incorporating a more precise Adjusted R-Squared measure and both rolling and single period Returns-Based Style Analysis, the peer groups resulting from the process are truly groups of similar strategies.
- Managers that implement a strategy across various styles or capitalizations are not excluded from consideration, which allows many alpha-generating managers to remain in the selection universe instead of being disregarded because they do not have pure style.
- Accounting for the error associated with estimating the asset class exposure and alpha improves not only the integrity of the peer groups, but also the precision of the alpha measurement itself

The elements of the PrecisionAlpha™ process work together in concert, to assure that managers with similar style will be grouped properly and the alpha measurement will be as accurate and precise as possible, accounting for estimation error in multiple phases using Bayesian statistical techniques. The PrecisionAlpha™ process reduces the "noise" that may cause a manager's alpha to be falsely inflated, and the PrecisionAlpha™ statistic itself is a more precise estimate of a manager's "true" alpha than is achievable through more traditional approaches. The PrecisionAlpha™ process selects skilled managers capable of managing money in either style-pure or multi-style strategies.

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