



## Using Active Share to Evaluate Single and Multi-Manager Portfolios

### Executive Summary

In recent years, a relatively new statistic, called “active share,” has attracted considerable attention from members of the investment community. Active share is a statistic that describes the degree to which the holdings of an investment fund differ from the holdings of the fund’s benchmark. Investors and academics have produced numerous papers on active share; some portray it as a powerful metric that can be used to isolate effective active managers, while others highlight its imperfections and warn of its limited utility. After considering multiple perspectives, we assert that active share is indeed a useful statistic for evaluating investment strategies, but investors must take into account several limitations in order to use it appropriately.

In the first section of this paper, we evaluate how active share can be used to guide individual manager selection decisions, as well as assist in ongoing manager monitoring. In the second section, we present a new application of active share by employing it at the asset class level. Specifically, we use active share to evaluate multi-manager, U.S. large cap equity portfolios. We choose U.S. large cap equity due to the fact that this sub-asset class is widely viewed as being highly efficient, and it also provides an especially robust data set for analysis. With this exercise, we demonstrate how investors can use active share to determine an optimal number of managers to include in a multi-manager portfolio. Our intent is for investors to use this paper to improve both the quality of individual manager selection decisions, as well as the portfolio construction process for multi-manager portfolios.

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### Using Active Share to Evaluate Individual Managers

Active share originated in 2009 with the publication of a paper by Martijn Cremers and Antti Petajisto, entitled “How Active is Your Fund Manager? A New Measure That Predicts Performance.”<sup>1</sup> Active share is calculated by comparing the weight of each stock in an investment portfolio to the weight of that same stock within an appropriate benchmark index. The formula for active share is presented below.

$$Active\ Share = \frac{1}{2} \sum_{i=1}^n |wFund_i - wIndex_i|$$

The value of a portfolio’s active share increases as the difference in holdings between a fund and its benchmark increases. The primary insight presented in the Cremers and Petajisto paper is that investment strategies with higher levels of active share are more likely to outperform their respective benchmarks. They also identify a specific category of high active share managers, which they label “diversified stock pickers,” that have historically provided the most attractive prospects.<sup>2</sup> According to Cremers and Petajisto, in addition to providing high active share,

diversified stock pickers avoid over concentration in a small number of securities, which can lead to high (and often undesirable) levels of tracking error\* relative to the index.<sup>3</sup> **Figure 1** presents a two-by-two matrix that categorizes the four investment strategies evaluated by Cremers and Petajisto based on levels of active share and tracking error.

**Figure 1: Active Manager Types**

		Level of Tracking Error	
		Low	High
Level of Active Share	High	Diversified Stock Pickers	Concentrated Stock Pickers
	Low	Closet Indexing	Factor Bets

*Source: Cremers and Petajisto. (March 31, 2009)*

The authors' general message is that investors should express a bias toward the selection of "diversified stock pickers." In other words, they recommend seeking managers that actively differentiate the weighting of individual stocks in their portfolio relative to the weighting of the index (high active share), but do so in a diversified manner such that they have low risk relative to the risk of the index (low tracking error). Backing their research, they provide empirical evidence that using active share can improve an investor's odds of selecting an active manager that adds value. However, they also concede that active share is by no means a silver bullet; there are many additional factors that investors must consider when evaluating manager skill. That is to say, active share is necessary for outperformance to occur, but not sufficient in and of itself.

Echoing the Cremers and Petajisto research, RVK evaluates active share as part of our manager search and monitoring process, but we also understand that active share must be used in conjunction with many other quantitative metrics and qualitative analysis. In the remainder of this section, we discuss how active share can be used effectively in the manager selection and monitoring process. We then conclude by outlining several important limitations of active share.

\* Tracking error is a metric that gauges the extent to which a manager's returns differ from the return of the index.

### ***Use of Active Share for Investment Manager Selection***

The results reported by Cremers and Petajisto provide evidence that the probability that a manager will outperform its benchmark decreases as the active share of its portfolio decreases. Generally, low active share managers, as defined in the Cremers and Petajisto paper, were those with active share levels below 60%; this subset of managers underperformed their benchmark at a higher rate than managers with active share levels above 60%. The theory behind this observation is fairly simple—a strategy that differs more from the benchmark has more opportunities to outperform (or underperform the index in cases in which managers lack skill). On the flipside, a strategy with holdings that are similar to the benchmark will need to substantially outperform on the few deviations from the benchmark that it holds in order for the entire portfolio to outperform.

Proponents of active share argue that if an investor is forced to blindly choose an investment manager based solely on active share, selecting a higher active share manager should provide a higher probability of success. We agree with the assertion that, at the margin, targeting talented managers with high active share, compared to those with low active share, allows for a greater probability to outperform the benchmark. Therefore, we believe that both current and historical active share should be used to evaluate new managers before adding them to a portfolio. However, as previously stated, active share is just one metric, and a robust manager selection process must include additional quantitative and qualitative criteria.

### ***Use of Active Share for Investment Manager Monitoring***

After hiring an investment manager, it is critical for investors to continuously verify that the manager is well-equipped to generate excess return. In addition to scrutinizing the manager's performance and strategic positioning, it is often useful to measure the level of active share. Should the active share of the portfolio decline over time, this may signal that the manager is no longer structured to deliver acceptable returns. A decline may occur for a variety of reasons, such as excessive asset growth, change in investment strategy, or purposeful "closet indexing" designed to prolong previously generated excess return. On the flipside, significant increases in active share may also signal problems. For example, it may indicate that the manager is establishing exposures that are inconsistent with the mandate or simply taking on unacceptable risk. In summary, while increases or decreases in active share are not negative indicators by definition, they may signal undesirable shifts in strategy. Therefore, we encourage investors to include active share analysis, along with many other quantitative data and qualitative information, when evaluating managers.

### ***Limitations of Active Share***

Successful investment manager analysis can never be based on a single metric. While active share is useful, it is not unique in this regard, and it should always be used in conjunction with other metrics. A few of the more noteworthy limitations include:

1. **Active Share Does Not Measure Manager Skill**—Investors must remember that active share simply measures the degree to which a portfolio differs from a benchmark index. While exceptional managers often exhibit high active share, exceptionally bad managers may exhibit the same trait. In fact, of the 479 U.S. large cap equity managers reporting in the eVestment database, 80% have an active share that falls above the 60% threshold established by Cremers and Petajisto as an indicator of closet indexing.<sup>†</sup> It is important to note that of the 80% of managers above the 60% active share threshold, roughly 45% still

<sup>†</sup> One reason we see this pattern is simply that eVestment requires managers to self-report statistics. Managers with low active share are less likely to report this statistic to the database.

underperformed their preferred benchmark over the 7-year period ended March 31, 2015. The key point is that while active share may be a useful tool for reducing a pool of potential candidates, investors should never use it as the sole proxy for skill. More important is the process of isolating a manager's sources of competitive advantage, such as the strength of team member skills and experiences, team and firm stability, and other distinct sources.

2. **Active Share Can Be Gamed**—In addition to measuring the level of active share, investors should carefully evaluate the source, as it is a metric that can be gamed. For example, one method of boosting active share is to select securities from another asset class entirely. While this may be acceptable for some investment strategies, it can also be done inappropriately. For example, an inappropriate example is if a U.S. large cap equity manager raises the active share of the portfolio by increasing its exposure to international equity. For investors that maintain distinct international and domestic equity portfolios, this tactic may be inappropriate, as it impacts the desired beta exposure in the total portfolio.
3. **Active Share Can Be Miscalculated**—Another way in which active share can be used inappropriately is if it is calculated using the wrong benchmark. This can simply be a mistake on the part of an analyst, but in a more typical case the manager or analyst selects a benchmark that does not serve as the best representation of the risk and return attributes of the strategy. Before running an active share analysis, investors must ensure that the most appropriate benchmark is in use—even if that benchmark differs from the one recommended by the manager.
4. **Active Share is Not the Only Indicator of a Manager's Strength and Portfolio Fit**—While this may state the obvious, there are many other useful metrics that should be used to evaluate managers. In fact, Cremers and Petajisto themselves used both active share and tracking error to define their favored investment strategy—diversified stock pickers.<sup>4</sup> The point is that investors should employ a full toolbox of quantitative metrics and qualitative investment criteria to evaluate investment managers for skill and fit in their portfolio.
5. **Incrementally Higher Fees May Eliminate the Advantages of High Active Share**—One simple truth in investing is that the fees paid by investors remain an important predictor of results. Numerous studies support this fact, such as the recent comprehensive study published by Morningstar.<sup>5</sup> Although high active share may serve as an indicator of value, it should not be pursued at any cost. Skilled managers who are aware of a market premium for high active share may very well charge fees that exceed the benefits.

## Using Active Share to Evaluate Multi-Manager Portfolios

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The benefit of using active share to evaluate individual managers is well documented and supported by empirical research. However, in our review of literature, we noted very little research on the potential use of active share to evaluate multi-manager portfolios at the asset or sub-asset class level. Ironically, this application may prove more valuable, as many investors fail to appreciate the costs of over-diversification. Over-diversification occurs when investors create portfolios that consist of managers that appear highly active *individually*, but *collectively* resemble the broad index against which the total portfolio is benchmarked. In effect, this causes the investor to pay active management fees for a portfolio that is unlikely to exceed the returns of the benchmark.

In order to shed light on this issue, we constructed a simulation to reveal how active share changes as more managers are added to a multi-manager portfolio. We also observed the impact of adding managers (and reducing

active share) on the underlying return, risk, and investment management costs of the total portfolio. In the remainder of this section, we summarize our simulation methodology, key observations, and resulting conclusions.

### *Methodology*

#### ❖ Investment Manager Universe Construction

We began our simulation by constructing a universe of 37 U.S. large cap equity mutual funds. Our goal was to identify a subset of U.S. large cap equity managers that individually demonstrate high active share. Criteria that we used to select the funds were:

1. **U.S. Large Cap Equity Investment Strategy**—All funds in our universe pursued a U.S. large cap equity investment strategy, and as such were benchmarked against the S&P 500 or Russell 1000 Index.
2. **Seven-Year Track Record**—In order to ensure a sufficient amount of data for analysis, each fund reported at least seven years of returns as of March 31, 2015. It is important to note that this criterion likely biases the performance of the universe upward, as poor performing funds are more likely to exit the universe before achieving a seven-year track record.
3. **Tracking Error**—The funds were required to have a tracking error of less than 8% over the trailing five-year period. We applied this criterion to eliminate managers that appeared to take abnormally large factor bets or establish abnormally high levels of portfolio concentration.
4. **Active Share Above 60%**—The active share of each manager was required to exceed 60%, which is the threshold that Cremers and Petajisto established as an indicator of “closet indexing” behavior. This criterion was important because we wanted to measure how the number of managers in a multi-manager portfolio impacts active share and performance even when each manager individually demonstrates high active share.

#### ❖ Simulated Portfolio Constructions

In order to create simulated portfolios, we randomly selected investment managers from our universe according to the probabilities outlined in **Figure 2**. We then assembled multi-manager portfolios ranging in size from 1 to 10 managers. We ran this simulation 15 times, and then calculated the median performance and active share for each portfolio according to the number of managers in the portfolio. When creating these portfolios, we made a critical assumption that the portfolio creator would have a greater than 50% probability of selecting managers that provided excess return over the seven-year period. In other words, we assumed that the creator of the portfolio was skilled at manager selection with the specific probabilities listed in **Figure 2**.

**Figure 2: Probability of Selecting a Manager that Provided Excess Return over a Seven-Year Period**

Number of Managers	Probability
Managers 1-5	60%
Managers 6-10	55%

It is important to explain our assumption that success probability would deteriorate as more managers were added to the portfolio. We made this assumption to reflect the fact that successful portfolio creators exhaust the number of high performing managers in the universe as they add more managers. Therefore, as the number of skilled managers available for selection decreases, we believe the probability of choosing a successful manager should also decrease. In short, we think a decline in success probability accurately reflects reality. While these probabilities embed a certain expected deterioration in portfolio performance, it is also important to note that deterioration was observed even before reaching the second probability level of 55%.

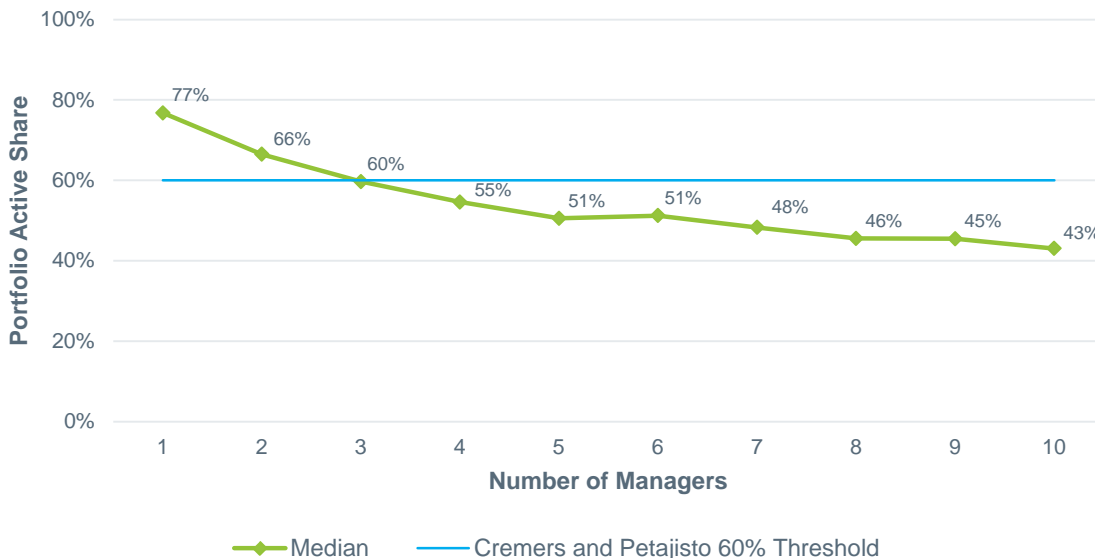
**Observations**

After running 15 iterations, we had a total of 150 portfolios available for analysis. We proceeded to evaluate active share and performance metrics. Three of our most notable observations are summarized below and on the following pages.

**Observation #1: Active Share Deteriorated Rapidly as Managers Were Added to the Portfolio**

While we concede that this may state the obvious, our first observation is that as we added more managers to the portfolio, total portfolio active share quickly deteriorated. What is more notable is the fact that this deterioration may occur more quickly than many investors assume. In our experiment, active share declined from nearly 80% on average with a single manager to less than 60% after the addition of a fourth manager. In other words, after constructing a portfolio with only four managers, the total portfolio began to resemble a closet index fund. **Figure 3** shows the decline in total portfolio active share as managers are added to the portfolio.

**Figure 3: Active Share by Number of Managers in Portfolio**



Source: RVK, Inc. (2015)

**Observation #2: Over-Diversification Led To Less Desirable Performance Outcomes**

Our analysis of excess return and risk-adjusted return (using the Sharpe ratio) indicated that the portfolio was optimized with four managers. After exceeding four managers, performance steadily declined and then flattened out at a reduced level. **Figure 4** and **Figure 5** show the excess return and Sharpe ratio for the test portfolios. When considering this data, we believe it is most important to consider the underlying dynamic rather than the specific number of managers that constituted an optimal portfolio in this exercise. Depending on client need and risk preference, the correct number of managers could be one, two or even six. The key takeaway is that this type of analysis should be considered during the portfolio construction process. Finally, it is important to note that while the study initially revealed gains in outperformance as active share decreased, this is not an indictment of active share. Instead it supports the power of diversification. Managers with positive and uncorrelated excess returns can produce better risk-adjusted returns for the total portfolio. However, an investor should also be careful not to oversupply the portfolio with too many managers, as the explicit and implicit costs of adding that extra diversification may exceed the benefit.

**Figure 4: Median Seven-Year Return by Number of Managers in Portfolio**



Source: RVK, Inc. (2015)

**Figure 5: Median Seven-Year Sharpe Ratio by Number of Managers in Portfolio**



Source: RVK, Inc. (2015)

**Observation #3: Costs of Additional Managers Created Hidden Performance Drag**

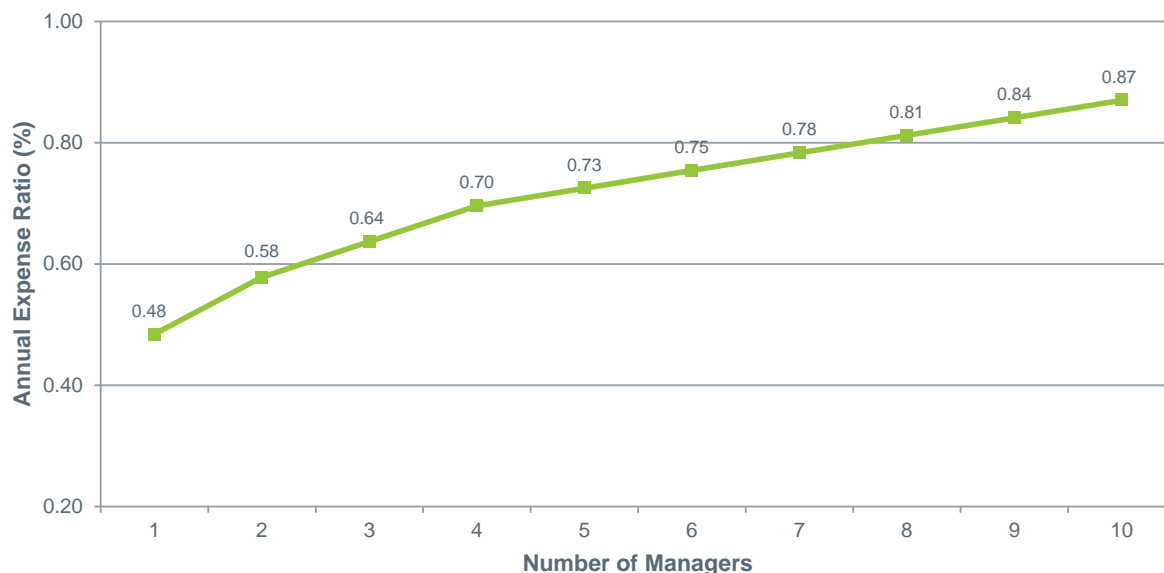
Investors typically construct multi-manager portfolios to ensure adequate manager diversification. However, our first two observations clearly show that manager diversification is not free. In our analysis, we noted that both absolute and risk-adjusted returns at best flatten (and at worst decline) as the portfolio exceeds four managers. Unfortunately, this analysis likely underestimates the negative impact of adding managers, as it is based on mutual fund returns that provide a single flat investment management fee to calculate portfolio returns. In addition, the analysis does not factor in other indirect costs of portfolio management. In the real world, both direct and indirect costs increase with the number of managers in a multi-manager portfolio. When constructing a multi-manager portfolio, investors must also consider the impact of these costs. Additional detail on the nature and potential impact of these costs is summarized below.

- a. **Fee Schedule Impact**—As investors add managers to a portfolio, they often experience material (and measurable) increases in investment management fees. For example, for investors using separate accounts, fee breaks offered by individual managers quickly become unobtainable as the total investment is spread over multiple managers. **Figure 6** shows just how material this cost can be. The figure shows how the investment management costs for a \$100 million U.S. large cap equity portfolio increase as more managers are added to the portfolio.<sup>‡</sup> The fee breaks used for this analysis are based on median break points and fees for the eA U.S. large cap equity universe for separate accounts. While not included in this analysis, a reasonable assumption can be made that clients who choose to spread their assets over a large number of mutual funds may also experience higher fees as they will be less able to access lower cost share classes.

<sup>‡</sup> The analysis assumes an equal allocation to each manager.



**Figure 6: Weighted Average Investment Management Fee  
by Number of Investment Managers**



*Source: RVK, Inc. (2015)*

- b. **Internal and External Monitoring Costs**—As more managers are added to a portfolio, investors may need to hire more staff in order to monitor the portfolio adequately. Investors may also need to purchase more advanced monitoring tools to evaluate increasing portfolio complexity. Alternatively, if investors fail to invest in the required staff and tools, portfolio returns and portfolio risk may suffer.
- c. **Costs of Investment Professional Distraction**—As more managers are added to a portfolio, investors have a greater risk that the sheer complexity of the portfolio will distract staff such that their ability to select and retain the best managers is impaired. This is likely the most difficult “cost” to quantify, but it is one that must be considered.
- d. **Custodial Costs**—As additional investment managers are added to a portfolio, the number of custodial accounts and trades increases. While the additional costs are likely less significant than the costs associated with lower fee break points, these costs must be considered.

## Conclusion

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Our research and experience demonstrate that active share is a useful tool for analysis of both individual and multi-manager portfolios. Listed below are our key takeaways from our review of existing research and experimentation with using active share to evaluate multi-manager portfolios.

1. **Active Share is a Useful but Limited Statistic**—Although active share is a powerful tool, it is by no means a silver bullet. In order to use active share appropriately, investors should consider the limitations that we have outlined in this paper and combine their analysis of investment managers with other proven quantitative metrics and qualitative criteria.
2. **Investors Must Consider Additional Costs and Diminishing Returns of Manager Diversification**—The message from our research is clear on the issue of manager diversification: as more managers are added to a portfolio, the active share of the portfolio declines, direct and indirect portfolio management costs increase, and investors, at best, receive minimal incremental diversification benefit for large multi-manager portfolios. While our analysis identified four managers as the point of diminishing returns in our simulation, we caution that this point will vary depending upon the asset class and type of strategy that an investor pursues.<sup>§</sup> The critical point is that investors should understand where the point of diminishing returns exists when they construct multi-manager portfolios, and they must not overlook the cost of adding investment managers. It is our belief that investors often overestimate the benefits of manager diversification while underestimating the costs.

## Endnotes

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1. Cremers, Martijn and Petajisto, Antti. “How Active is Your Fund Manager? A New Measure That Predicts Performance (March 31, 2009).” *Review of Financial Studies*, 2009, 22(9). Available at: <http://www.petajisto.net/research.html>
2. Ibid.
3. Ibid.
4. Ibid.
5. Kinneil, Russel. “How Expense Ratios and Star Ratings Predict Success.” <http://news.morningstar.com/articlenet/article.aspx?id=347327>

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<sup>§</sup> As an example, it is conceivable that a portfolio using a core-satellite approach could have a point of diminishing returns that is well above four managers.

## About RVK

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RVK was founded in 1985 to focus exclusively on investment consulting and today employs over 100 professionals. The firm is headquartered in Portland, Oregon, with regional offices in Chicago and New York City. RVK is one of the ten largest consulting firms in the U.S. (as defined by Pensions & Investments) and has a diversified client base of over 190 clients covering 28 states. This includes endowments, foundations, corporate and public defined benefit and contribution plans, Taft-Hartley plans, and high-net-worth individuals and families. The firm is independent, employee-owned, and derives 100% of its revenues from investment consulting services.