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ORIGINAL RESEARCH FOR INQUISITIVE INVESTORS



Active Share: Finding "Value-for-Money"

by Barry M. Gillman, CFA

Overview

Active Share is useful in evaluating both the risk and the potential of equity portfolios, but only if it is calculated correctly and used in the right context. We believe that's not always the case, leading investors to conclusions that may be misleading or just plain wrong. The goal of this research is to help investors understand and hence avoid these errors so they can get the best use out of their Active Share information.

In particular, we focus on three issues:

1. The relationship between Active Share and performance
2. The prevalence (or otherwise) of “closet indexing”
3. The “value-for-money” delivered by active managers

Active Share and Performance

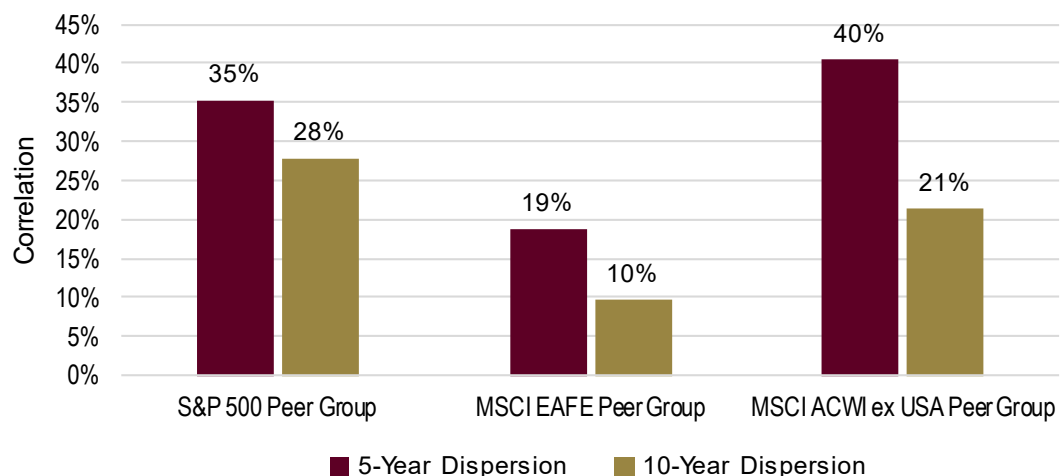
Active Share is a simple measure of how much a portfolio differs from an index.¹ A high Active Share is a necessary precondition for performing significantly differently from that index. But different is not the same as better. High Active Share exposes the investor to the risk of underperformance as well as outperformance.

We analyzed the correlation between Active Share and relative performance for both U.S. and non-U.S. funds. **We find no consistent relationship between them.** For some periods/universes the correlation is positive, for others it is negative, and in yet others, it is immaterial.

There is however a positive correlation between Active Share and dispersion around the index, as shown in Exhibit 1. The higher the Active Share, the more the performance *differs* from the index, regardless of whether it is over- or under-performance. This confirms statistically that Active Share measures “different.” There is no confirmation that it measures “better.”

Exhibit 1: Within Peer Groups of Portfolios, Active Share Is Correlated to the Difference of Performance from Index, Regardless of Sign (positive or negative)

Correlation Between Active Share and Absolute Dispersion of Performance vs. Index



Source: Morningstar Direct, Brandes Institute. Data as of June 30, 2018. Absolute dispersion is the difference of a portfolio's results from the index, regardless of sign. For details of peer group composition, see Appendix.

...we suggest that investors need to use a range of manager selection techniques, and not rely on Active Share as their primary measure of manager suitability.

While it is possible that Active Share may be a predictor of outperformance when used in conjunction with other measures, such as turnover, concentration and holding period, we suggest that investors need to use a range of manager selection techniques, and not rely on Active Share as their primary measure of manager suitability.

Active Share and Valid Comparisons

In our view, the debate over closet indexing and "value-for-money" often reaches misleading conclusions because typically the data used does not lend itself to "apples-to-apples" comparisons.

Active Share is measured relative to an index, and for the measurement to be valid, it is important that the index used is appropriate for that portfolio. Even if that mistake is avoided, two other errors can distort conclusions, especially as most studies of Active Share aggregate large amounts of data, typically from mutual fund databases.

1. Allowing different benchmarks in the same set of data. This will only cause small inconsistencies when including funds benchmarked to similar but different indices (e.g., the S&P 500 vs. the Russell 1000), but will cause more sizeable biases when distinct mandates are aggregated together (e.g., small, mid and large cap funds). Funds benchmarked to more concentrated benchmarks will typically have lower Active Share².
2. Including funds that are not actively managed in the traditional way. This is a particular problem when investigating closet indexing and "value-for-money."³ There are an increasing number of "engineered" funds competing for investor assets, such as systematic smart beta or enhanced index funds, as well as funds that combine two or more approaches within one fund (e.g., multi-manager or multi-factor). While these may be valid and viable investment processes, they typically have quite different Active Share and fee characteristics compared to traditional actively managed portfolios.

The first of these errors is (relatively) easy to correct by careful examination of the data. The downside is that at the end of the screening process, there are fewer funds left to analyze.

The second error is both more difficult to correct as well as more impactful on the conclusions.

- It's difficult to correct because databases generally do not separate their funds into "traditional" and "engineered," so it is up to the analyst to examine the funds one-by-one to sort them into the appropriate category. To the best of our knowledge, ours is the first research study to do this.
- It is more impactful on the conclusions because to analyze the prevalence of closet indexing and value-for-money among traditional active funds (managed by a portfolio manager and/or analyst team using primarily fundamental analysis), then it seems evident to us that the data should be limited only to that type of fund.

To generate a true apples-to-apples comparison, we have therefore developed our dataset to avoid both these types of errors, and hence aim to provide bias-free analysis of the questions of closet indexing and value-for-money. We refer to traditional and engineered active funds using the definitions in this section.

In brief, we have analyzed a universe of around 500 equity mutual funds. Just under 300 of these are U.S. large cap equity benchmarked to the S&P 500. Just over 200 are non-U.S. large cap equity funds, which we divided into two subsets: benchmarked to MSCI EAFE or to MSCI ACWI ex USA. More details are provided in the Appendix.

Active Share and Closet Indexing

Closet indexing has always been part of the Active Share discussion. Active Share provides a numerical measure of the level of "activeness." As such, an Active Share below some level of that measure may trigger questions about whether a portfolio manager is not being active *enough*, a closet indexer.

...the level of Active Share can vary significantly depending on the benchmark.

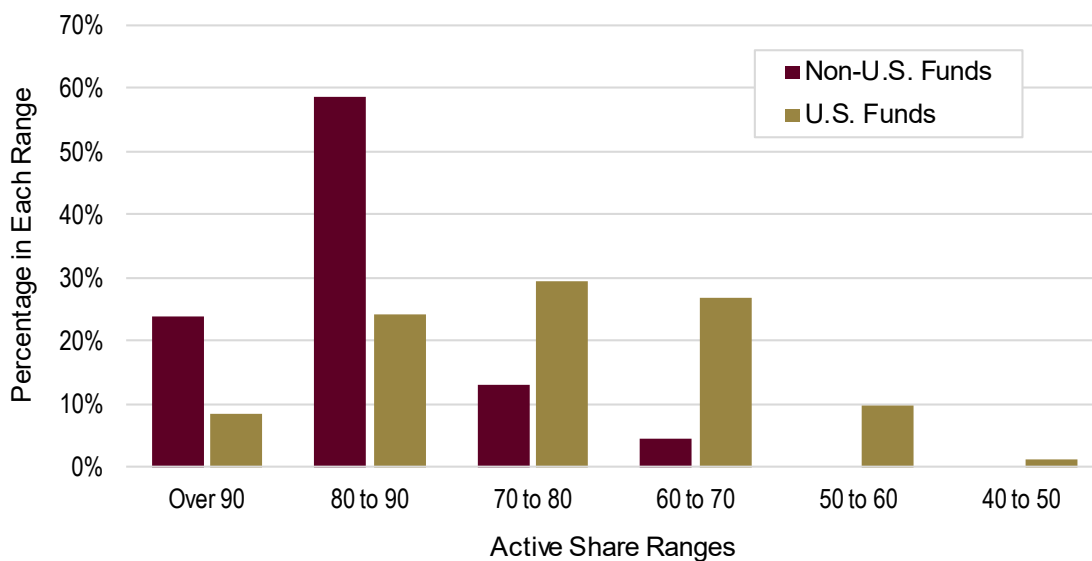
This is a simple concept, but with two practical difficulties.

1. First, there is no agreed level of where Active Share drops into “closet index territory.” Most would agree that Active Share of 85 is not closet indexing and that a score of 5 would be. But even for U.S. equities (where most of the industry research has focused), there is no agreement on where to draw the line. The most common range of suggestions aim somewhere between 40 and 60 for U.S. large cap equities, but to a large extent, the cut-off for closet indexing is in the eye of the beholder.
2. Second, as we’ve shown, the level of Active Share can vary significantly depending on the benchmark. For example, Active Share of 60 may be considered low for a U.S. equity portfolio, but would be high if the portfolio were benchmarked to the much more concentrated Canadian large cap index. So, the closet index cut-off level (whatever it is) must be different for each benchmark.

Regulators and legislators in Europe and in the United States are now increasingly engaged in dealing with these issues. The reality is that there is no easily agreed cut-off level for closet indexing, so the most practical approach in our view is to seek disclosure of a portfolio’s Active Share and its benchmark, and make sure this information is supported by effective communication of how it should be interpreted. We see some limited progress towards disclosure, but a big gap remains regarding communication and interpretation.

In our view, a good starting point is the distribution of Active Share across comparable peer groups. Exhibit 2 presents that distribution for traditional funds. Non-U.S. funds have a median Active Share of 86, higher than the U.S. funds’ median of 74, and with a significant skew towards the higher Active Share ranges: 83% of these traditional non-U.S. funds have Active Share of over 80.

Exhibit 2: Dispersion of Active Share by % in Each Range, U.S. and Non-U.S. Funds



Source: Morningstar Direct, Brandes Institute. Data as of June 30, 2018. Note: data includes only traditional active funds (256 U.S.; 177 Non-U.S., combining 108 EAFE funds and 69 ACWI ex U.S. funds).

This data illustrates the difficulty of selecting an arbitrary “cut-off line” to identify closet-indexers. If Active Share of 50 is chosen as the cut-off, then just 1% of U.S. portfolios are below this level, and none of the non-U.S. portfolios. Even using a stricter (and in our view less defensible) level of 60, this would capture 10% of the U.S. portfolios, but still nothing in the non-U.S. peer group.

In practice, there appear to be few traditional active large cap equity portfolios that can validly be accused of being closet-indexers.

In practice, there appear to be few traditional active large cap equity portfolios that can validly be accused of being closet-indexers. Nevertheless, investors would do well to probe further when their portfolios have Active Share among the lowest of their peer group. For example, a portfolio in the lowest Active Share decile in its peer group may deserve more detailed questioning.

This lowest-decile-breakpoint is not a widely available number, but to assist investors, we are able to provide a simple calculation that investors can use to estimate whether the Active Share of their portfolio is in the bottom decile of its peer group. The calculation is based on our earlier work on Expected Active Share⁴. A detailed explanation is included in the Appendix, and we include the simple version here. The only input needed to determine the low-decile-breakpoint is the index concentration, as measured by the percentage of that index in its ten largest constituents.

- I. Multiply the top-ten concentration percentage by 1.1
- II. Subtract that number from 95 (this gives the estimated median Active Share for portfolios benchmarked to that index)
- III. If the result is over 75, subtract 10, or if the result is equal to or below 75, subtract 12.

The resulting number⁵ is an estimate of the lowest decile breakpoint for portfolios benchmarked to that index. If a portfolio's Active Share is below that level, ask questions.

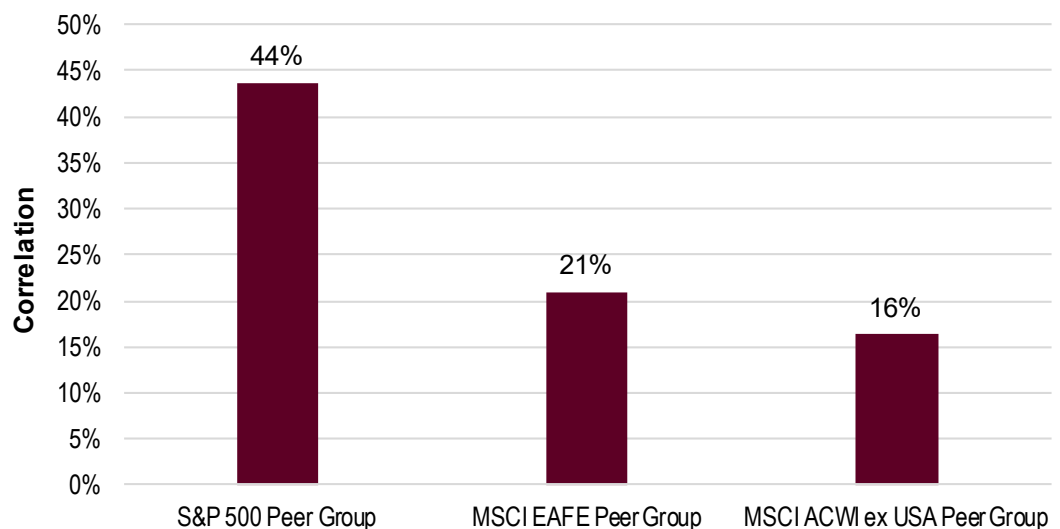
Active Share and Value-for-Money

If it's hard to find any closet indexers, it is much easier to analyze the spectrum of value-for-money across active managers. The industry discussion has largely focused on whether there is any material correlation between Active Share and fees: if investors pay higher fees, do they get higher Active Share?

Our data provides an answer: a "qualified yes." A qualification is that while the correlation is clearly observable, it is not especially high, particularly among non-U.S. portfolios.

We can see in Exhibit 3 the correlation between Active Share and management fee for the traditional funds. These are all positive, and the highest is the 44% correlation between Active Share and fee for the U.S. equity peer group.

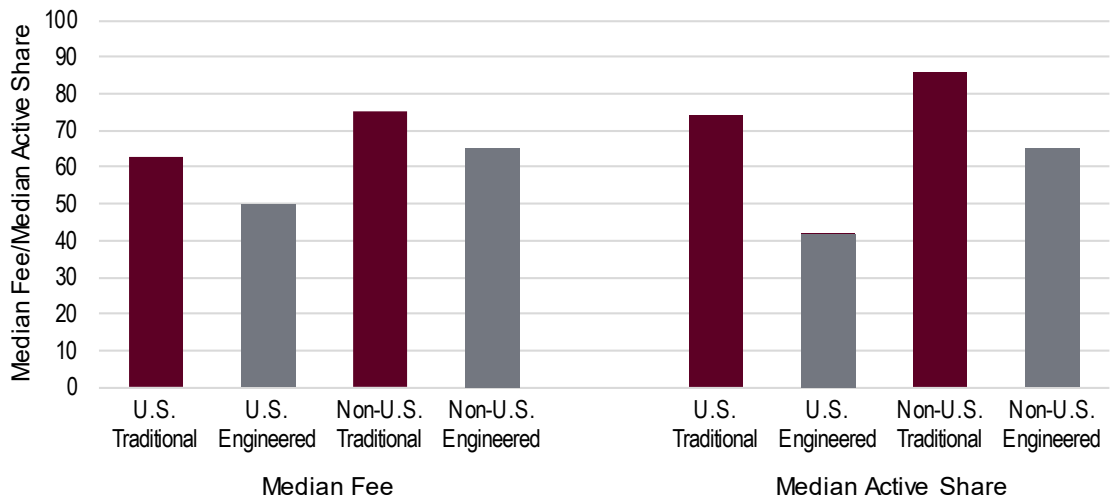
Exhibit 3: Positive Correlation Between Active Share and Management Fee



Source: Morningstar Direct, Brandes Institute. Data as of June 30, 2018. Using Gross or Net Expense Ratio instead of Management Fee also shows positive correlations with Active Share.

There are not enough engineered funds in our database to draw meaningful conclusions about the value-for-money relationship among engineered funds. However, as shown in Exhibit 4, the median Active Share and the median fee for the U.S. and non-U.S. engineered funds are all lower than their traditional counterparts. (Fees and Active Share for the engineered funds are shown with lighter colored bars in Exhibit 4.) That data is consistent with the positive correlation between Active Share and fee. So, essentially investors do get what they pay for, when choosing between traditional and engineered funds.

Exhibit 4: Active Share and Fees are Higher for Traditional Than Engineered Funds



Source: Morningstar Direct, Brandes Institute. Data as of June 30, 2018. Fees expressed in basis points.

We can now address the value-for money question for investors in active portfolios. We take the ratio of Active Share divided by fee, which in our view is a suitable measure of value-for-money⁶. In Exhibit 5, we show the average “Active Share/Fee” ratio by decile for traditional funds. In the lower value-for-money deciles the pattern is similar for both U.S. and non-U.S. funds, but they diverge in the higher deciles, with some U.S. funds achieving much higher value-for-money scores than found in the non-U.S. peer group.

Exhibit 5: Value-for-Money by Decile for Traditional Funds (U.S. and Non-U.S.)

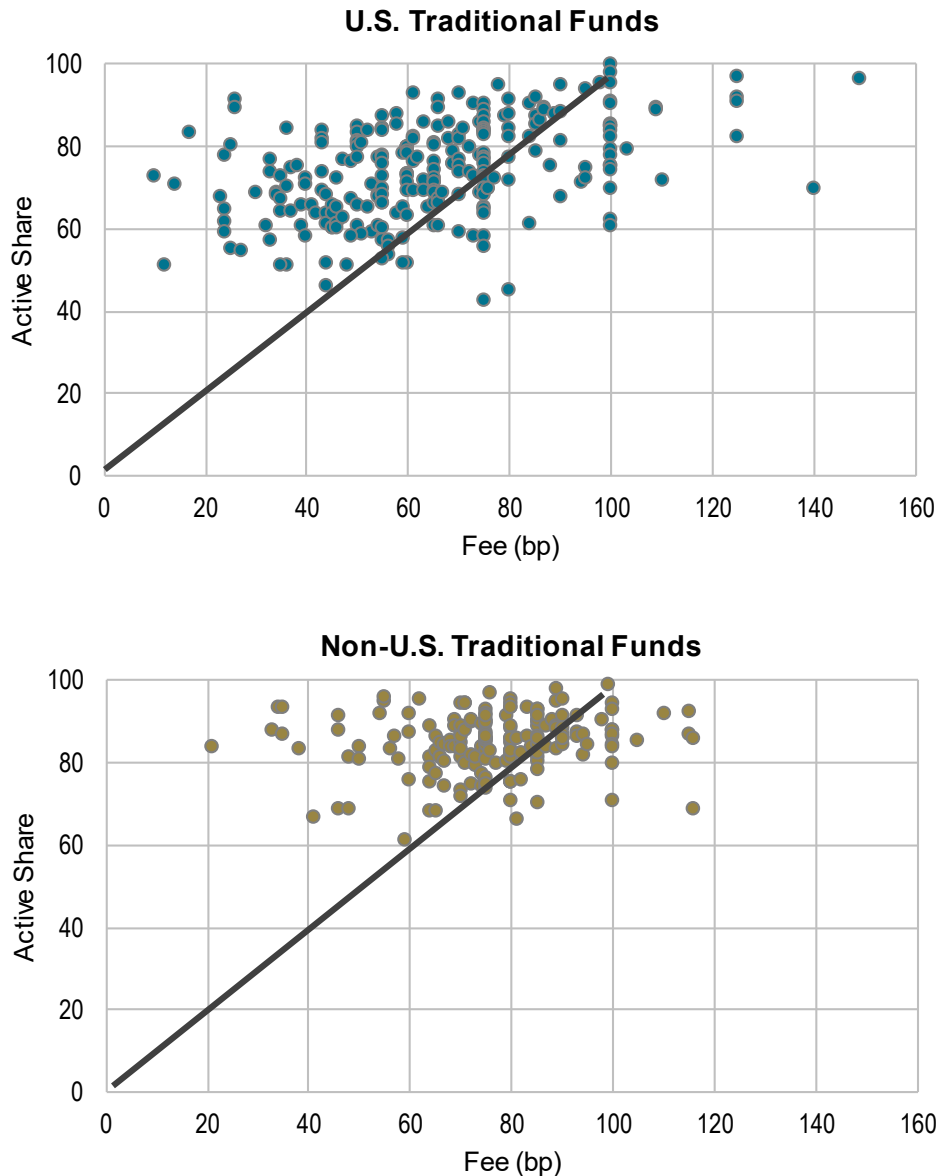
| Value-for-Money | Average Active Share/Fee | |
|------------------------------|--------------------------|----------------|
| | U.S. Funds | Non-U.S. Funds |
| Lowest Decile | 70 | 81 |
| Decile 2 | 88 | 94 |
| Decile 3 | 99 | 99 |
| Decile 4 | 105 | 103 |
| Decile 5 | 112 | 107 |
| Decile 6 | 120 | 113 |
| Decile 7 | 132 | 118 |
| Decile 8 | 147 | 124 |
| Decile 9 | 172 | 135 |
| Highest Decile | 298 | 206 |
| Lowest Quartile Break | 99 | 100 |

Source: Morningstar Direct, Brandes Institute. Data as of June 30, 2018.

At the other end of the scale for both peer groups, the breakpoint for dropping into the lowest quartile of value-for-money is essentially the same, a score of 100. At that score, Active Share equals Fee (in basis points). This suggests a simple rule-of-thumb for investors in large-cap developed market portfolios⁷. If your portfolio's value-for-money ratio is less than 100, then ask questions! A portfolio with a value-for-money ratio less than 100 will likely be in the bottom quartile of its peer group on that measure. The quick test for a large-cap U.S. or non-U.S. portfolio is to look at whether its Active Share is higher than its fee.

Exhibit 6: Value-for-Money (Active Share/Fee), U.S. and Non-U.S. Traditional Funds

If your portfolio's value-for-money ratio is less than 100, then ask questions!



Source: Morningstar Direct, Brandes Institute. Data as of June 30, 2018.

Exhibit 6 helps us understand what drives portfolios into low value-for-money territory: is it low Active Share, high fee, or a combination of the two? The black diagonal line on each chart is where Active Share equals Fee⁸. We saw from Exhibit 5 that this is the approximate boundary of the lowest quartile of value-for-money, and the portfolios in that quartile plot below and to the right of that line.

For both U.S. and non-U.S. peer groups, a substantial majority of the low value-for-money plots have fees that are above median⁹. However, the Active Share plots are spread both above and below median. The conclusion: **it is high fees that are the primary reason that portfolios score in the bottom value-for-money quartile, not low Active Share.**

Conclusion

The three issues raised at the beginning of this article can be summarized succinctly:

1. The relationship between Active Share and performance: **we don't find one, but we do find a relationship between Active Share and dispersion of results. That's because Active Share means "different from index", not necessarily "better than index."**
2. The prevalence (or otherwise) of "closet indexing": **closet-indexing is hard to define, and even harder to find. Instead, be wary of portfolios in the lowest decile of Active Share in the appropriate peer group.**
3. The value-for-money delivered by active managers: Active Share has a positive correlation with fee, and **it is high fees, not low Active Share, that is the primary reason that puts portfolios into the lowest value-for-money quartile. A useful rule-of-thumb is to be wary of the value-for-money delivered by large cap portfolios that have fees higher than their Active Share.**

Footnotes

¹ Active share is calculated by taking the sum of the absolute value of the difference of the weight of each holding in a portfolio vs. the weight of each holding in the index and dividing by two.

² Brandes Institute. "Is Your Portfolio's 'High Active Share' Really High?" October 2015.

³ In this context, "value-for-money" describes the relationship between a portfolio's Active Share and its fee. A higher value for money ratio suggests a greater level of activeness for each basis point of fee charged.

⁴ Brandes Institute. "Is Your Portfolio's 'High Active Share' Really High?" October 2015.

⁵ Example: if the S&P 500 top ten concentration is 22%, multiply 22 by 1.1, to get 24.2. Subtract from 95, resulting in 70.8. As this is below 75, subtract 12, giving an answer of 70.8-12=58.8, rounding to 59. We estimate that an S&P 500 benchmarked portfolio with Active Share less than 59 is likely to be in the bottom decile of its peers.

⁶ This differs from the Active Fee metric used by Martijn Cremers in "Active Share and the Three Pillars of Active Management," Financial Analysts Journal 2017, volume 73, number 2. Differences include our use of management fee instead of expense ratio, and our assumption that index fees are effectively zero.

⁷ This rule is not suitable for portfolio peer groups where the median fee is close to, or above 1.00%. As Active Share cannot be greater than 100, for such peer groups (typically of specialist mandates), Active Share/Fee will generally be below 100 for most portfolios.

⁸ For any given portfolio plot, the measure of value-for-money is the angle formed at the chart origin between the horizontal axis and the line from the plot to the origin. Mathematically, $\text{Tan}(\text{angle}) = \text{Active Share}/\text{Fee}$. In practice, to find the worst value-for-money portfolios, rotate the black line clockwise, and value-for-money reduces with the angle at the origin.

⁹ See Exhibit 4 for medians for fees and Active Share.

Appendix

Methodology and Data

The U.S.-registered, open-end mutual funds in this study are sourced from Morningstar with data as of June 30, 2018. The universes used are U.S. Large Cap Equity and Foreign Large Cap Equity. Within these universes, we selected only those portfolios benchmarked to three specific indices: S&P 500; MSCI EAFE; and MSCI ACWI ex USA.

We further divided each universe into two sub-sets depending on how the portfolios are managed. This selection decision was made after examining the Morningstar description of each fund.

We identified a subset of “traditional funds” that are managed by a portfolio manager and/or analyst team using primarily fundamental analysis.

We identified a subset of “engineered funds” that are not managed in that traditional way. These engineered portfolios include:

- Smart beta and enhanced index portfolios
- Asset allocation, multi-manager and multi-style/multi-factor portfolios which blend multiple managers and approaches
- Managed/targeted volatility portfolios
- Portfolios consisting substantially of derivatives
- Quantitative and systematic portfolios

The final dataset includes 286 U.S. large-cap funds benchmarked to the S&P 500. Of these, 256 are traditional and 30 are engineered. We have 215 large-cap non-U.S. funds. This includes 134 MSCI EAFE funds (108 traditional and 26 engineered) and 81 MSCI ACWI ex USA funds (69 traditional and 12 engineered).

Calculation of Expected Active Share, Lowest Decile Breakpoint

For full background on Expected Active Share, please see Brandes Institute 2015, “Is Your Portfolio’s ‘High Active Share’ Really High?” The basis for this work is the regression formula in Exhibit 3 of that paper. This demonstrates an R-squared of 90% between the concentration of an index (as measured by the percentage in its top ten holdings) and the median Active Share of portfolios benchmarked to that index. This allows the estimation of “Expected Active Share” or the median Active Share expected for a peer group of portfolios benchmarked to that index.

The regression formula is:

$$\text{Expected Active Share} = 0.9475 - 1.0957 * (\text{top ten concentration } \%)$$

This gives Expected Active Share as a decimal, so multiplying the result by 100 gives the answer in the more familiar range of 0-100.

By analyzing the distribution of Active Share across various peer groups benchmarked to different indices, we were able to develop a “rule-of-thumb” approach that approximated the third quartile and lowest decile break points for the peer groups for which we have data. By inference, we believe this rule may give a workable estimate for other benchmark breakpoints.

We kept the rule as simple as possible, as the goal is to have a practical approximation, not a theoretical model. For Expected Active Share (median) over 75, deduct 4 to estimate the third quartile break. For Expected Active Share equal to or below 75, deduct 6. When the third quartile break is estimated, deduct another 6 to estimate the low decile breakpoint.

The reason for the differentiation above or below 75 is our observation of the difference in distribution below the median for broad indices (typically the global indices with high Expected Active Share, usually above 75, with tight distribution below the median) versus more regional/domestic indices that generally have lower Expected Active Share and more spread-out distribution below the median.

Table 1: Concentration and Expected Active Share for a Range of Indices

| Index | Concentration Top Ten % | Expected Active Share, With Actual # Shaded Where Known | | | | | Source | Date | |
|-----------------------|----------------------------|---|---------------|----|---------------|----|--------|--------------|----------|
| | | Est. Median | Est. 3Q Break | | Est. 3Q Break | | | | |
| MSCI ACWI Small Cap | 1.6% | 93 | 87 | 89 | 83 | 83 | 76 | MSCI | 9/28/18 |
| MSCI ACWI ex USA | 9.3% | 85 | | 81 | | 75 | | MSCI | 9/28/18 |
| MSCI ACWI | 11.3% | 82 | | 78 | | 72 | | MSCI | 9/28/18 |
| MSCI EAFE | 11.5% | 82 | 85 | 78 | 81 | 72 | 75 | MSCI | 9/28/18 |
| MSCI World | 12.7% | 81 | | 77 | | 71 | | MSCI | 9/28/18 |
| Russell 3000 | 18.1% | 75 | | 69 | | 63 | | ishares, IWV | 10/16/18 |
| Russell 1000 | 19.6% | 73 | | 67 | | 61 | | ishares, IWB | 10/16/18 |
| S&P 500 | 21.9% | 71 | 74 | 65 | 66 | 59 | 59 | S&P | 9/28/18 |
| MSCI Emerging Markets | 24.0% | 68 | | 62 | | 56 | | MSCI | 9/28/18 |
| S&P/TSX 60 Capped | 37.4% | 54 | | 48 | | 42 | | ishares, XIC | 10/16/18 |

Source: Brandes Institute, MSCI, S&P, Blackrock iShares.

To illustrate, we show ten commonly used benchmarks in Table 1, with Expected Active Share (median) calculations and our estimates of the third quartile and low decile breaks for each. For the three indices analyzed in this paper, for which we have actual breakpoints, these have been included (shaded cells) for comparison purposes.

Additional Analysis and Observations

The Right Measure for Value-for-Money

Gross expense ratio (“GER”) is frequently used in academic and practitioner research that looks at whether investors are getting good value for the fees they pay. In our research, we use management fee, which is just one element of GER, excluding the administrative and other items that constitute the full operating cost of a mutual fund.

Why did we make that choice? We are analyzing the extent to which investment managers are providing value for the fees they charge, as opposed to whether investors are getting value from the mutual funds in which they invest. In our view, management fees are the appropriate measure for what we seek. Generally, management fee is under the control of the manager in a way that GER is not. The fees in this study of mutual fund data should be reasonably consistent with fees charged on institutional accounts, as the fee decision is typically made by the manager in the context of their whole book of business. GER is impacted by a range of business and operational factors that are unrelated to the investment process. In practice, the results of the research may not be significantly altered, as we find GER and management fee to be correlated (highly correlated in the case of our U.S. peer group, at 75%; more moderately for our non-U.S. peer group, at 32%).

As we are looking to hold managers accountable for the fees they charge for the investment approach they choose, we believe that management fee is a more appropriate measure than GER, in this context.

Active Share does vary, but generally tends to be relatively stable over extended periods.

...the number of holdings is significantly inversely correlated with Active Share as expected. However, the inverse correlation with fund size, while it exists, is small.

Active Share Over Time

In this research, we use current Active Share data, fee levels, and other portfolio characteristics. However, we compare this current data to performance over time. This raises the question of how stable Active Share is over time for each of the portfolios measured. We do not have this data for our peer groups as we do not have the historical holdings that would enable these very data-intensive calculations to be carried out. We have examined a selected number of portfolios over time and find that Active Share does vary, but generally tends to be relatively stable over extended periods. This is intuitively consistent with the observation that managers tend to be consistent over time in their process, and this (along with the selected benchmark) is the primary driver of their Active Share.

There are two consequences to note for our research. The first is that we accept that any inferences regarding Active Share and past results should be considered in the context of this lack of historic Active Share data. The second is the limitation of using a single data point (current Active Share) to determine whether a portfolio is providing poor value-for-money.

We accept that a manager's process from time-to-time may legitimately move the portfolio closer to the benchmark than it typically has been, hence lowering Active Share temporarily. Accordingly, we caution against making a poor value-for-money accusation against specific portfolios unless additional research is carried out on historic data to validate this.

Validation of Peer Group Data

We aim to use the most appropriate peer group by including only traditional portfolios with correctly matched benchmarks. We validated these peer groups against Expected Active Share, the average Active Share that would be expected from a peer group with each benchmark. See Table 2.

| Benchmark | Expected Active Median | Peer Group Active Share Median |
|------------------|------------------------|--------------------------------|
| S&P 500 | 74 | 74 |
| MSCI EAFE | 81 | 85 |
| MSCI ACWI ex USA | 86 | 87 |

Source: Morningstar Direct, Brandes Institute. Peer group data as of June 30, 2018. Note: data includes only traditional active funds (256 U.S.; 177 Non-U.S., including 108 EAFE funds and 69 ACWI ex USA funds). Expected Active Share sourced from Brandes Institute 2015, "Is Your Portfolio's 'High Active Share' Really High?"

Active Share and Other Characteristics

The concentration of a portfolio should have an impact on Active Share as, generally, the fewer the number of holdings, the lower the likely overlap with the benchmark. We would also expect that as portfolio size increases, Active Share declines, given that it becomes increasingly difficult for very large portfolios to move away from the largest index constituents. Hence, we would expect inverse correlations for both metrics with Active Share.

Table 3: Correlation between Active Share and Fund Size and Number of Holdings

| Active Share correlation with: | Fund Size | # Holdings |
|--------------------------------|-----------|------------|
| S&P 500 funds | -0.20 | -0.52 |
| MSCI EAFE funds | -0.03 | -0.62 |
| MSCI ACWI ex USA funds | -0.26 | -0.72 |

Source: Morningstar Direct, Brandes Institute. Peer group data as of June 30, 2018. Note: data includes only traditional active funds (256 U.S.; 177 Non-U.S., including 108 EAFE funds and 69 ACWI ex USA funds).

In Table 3, we find that the number of holdings is significantly inversely correlated with Active Share as expected. However, the inverse correlation with fund size, while it exists, is small. Part of the reason may be that our data measures only the size of the specific fund in the Morningstar database, while there may be significant assets managed in other vehicles in a similar strategy. This could dilute the information value of the fund size data in our research, and possibly explain the low inverse correlations between Active Share and fund size.

Active Share and Style

Morningstar data includes the style of each portfolio. In Table 4, we show the differences in value-for-money and its components (Active Share and Fee) broken out by style.

Table 4: Median by Style

| U.S. Large Cap Equity | | | | |
|-----------------------|-----------------|---------------------|------------|------------------------|
| | Number of Funds | Median Active Share | Median Fee | Median Value-for-Money |
| TRADITIONAL | | | | |
| Growth | 81 | 71 | 0.65 | 110 |
| Value | 41 | 81 | 0.63 | 115 |
| Blend | 132 | 74 | 0.63 | 123 |
| ENGINEERED | 30 | 42 | 0.50 | 82 |

| Non-U.S. Large Cap Equity | | | | |
|---------------------------|-----------------|---------------------|------------|------------------------|
| | Number of Funds | Median Active Share | Median Fee | Median Value-for-Money |
| TRADITIONAL | | | | |
| Growth | 61 | 88 | 0.80 | 111 |
| Value | 30 | 85 | 0.78 | 110 |
| Blend | 86 | 85 | 0.75 | 108 |
| ENGINEERED | 38 | 65 | 0.65 | 96 |

Source: Morningstar Direct, Brandes Institute. Peer group data as of June 30, 2018. Note: data includes only traditional active funds (256 U.S.; 177 Non-U.S., including 108 EAFE funds and 69 ACWI ex USA funds).

Disclosures

The MSCI ACWI with net dividends captures large and mid cap representation of developed and emerging markets.

The MSCI ACWI ex USA Index with gross dividends measures equity market performance of developed and emerging markets excluding the United States.

The MSCI ACWI Small Cap Index captures small cap representation across 23 developed markets and 24 emerging markets countries. With 6,079 constituents, the index covers about 14% of the free float-adjusted market capitalization in each country.

The MSCI Emerging Markets Index with gross dividends captures large and mid cap representation of emerging market countries.

The MSCI EAFE Index with net dividends captures large and mid cap representation of developed market countries excluding the U.S. and Canada.

The MSCI World Index with net dividends captures large and mid cap representation of developed markets.

The Russell 3000 Index with gross dividends measures the performance of the largest 3,000 U.S. companies.

The Russell 1000 Index with gross dividends measures performance of the large cap segment of the U.S. equity universe.

The S&P 500 Index with gross dividends measures equity performance of 500 of the top companies in leading industries of the U.S. economy.

The S&P/TSX 60 Capped Index includes all constituents of the S&P/TSX 60 Index with relative weighting of each constituent capped at 10%. The S&P/TSX 60 is comprised of large cap securities, and is structured to match the sector weights of the S&P/TSX Composite Index.

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Correlation: A measure of how a security's (or a portfolio's) price moves relative to another; it can be expressed as a percentage, or as correlation coefficient with a range between -1.0 and 1.0. A correlation of 1.0 suggests prices move in lockstep; -1.0 suggests moves that are completely opposite. Zero suggests no relationship.

R-squared: R² (pronounced "R-squared") is the square of the correlation coefficient and measures the proportion of return variability in a security or portfolio explained by movements in the benchmark index. In the context of this study, R-squared measures the relationship between the median AS of each portfolio universe (measured using the peer group of funds benchmarked to each specific index), and the top ten concentration of that index. R-squared values range from 0 to 1; the closer to 1, the better the "goodness of fit" between the variables.

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The Brandes Institute
11988 El Camino Real
Suite 600
P.O. Box 919048
San Diego
CA 92191-9048
858.755.0239
800.237.7119

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