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Is Your Portfolio's "High Active Share" *Really* High?

A simple approach to evaluating a portfolio's Active Share in the context of its benchmark

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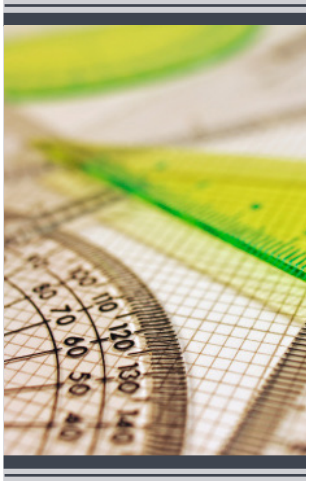


Is Your Portfolio's "High Active Share" *Really* High?

A simple approach to evaluating a portfolio's Active Share in the context of its benchmark

by The Brandes Institute and SEB Investment Management

Introduction

Active Share ("AS") is increasingly used in the investment industry to measure the degree to which a manager makes active decisions. Some investors seem to fall into the logic trap of equating high AS with an automatic expectation of future outperformance. Being different from a benchmark certainly increases the probability that results will differ from that benchmark. But that just means the likelihood is greater that a portfolio will either materially outperform or underperform its index before fees.

But even in that context, there's an important first step that most investors seem to miss: what is a high AS? Note that AS is a relative measure for any portfolio, not an absolute, because its calculation is dependent on the benchmark used. In this paper we show that the properties of the benchmark should be taken into account when assessing AS, otherwise there's a risk of misinterpreting this information. In this context there is no universal answer to whether AS is high or low. In particular, for a concentrated benchmark, it can be very hard to push AS to levels that are generally perceived as "high" without tilting the portfolio substantially to small cap stocks, which then may make the benchmark unsuitable. In this research, we provide a practical framework and method for investors to interpret AS correctly, and to compare different managers in order to make appropriate decisions in their portfolios.

AS is a relative measure for any portfolio, not an absolute.

The original developers of the Active Share concept, Cremers and Petajisto ("C&P"), showed a link between high AS and outperformance based on their research into a broad US mutual fund universe. This was documented in their 2009 paper "How Active is Your Fund Manager? A New Measure That Predicts Performance."

As the popularity of AS has grown, investors have typically taken the ranges of AS from that research and assumed they were universal. For example, C&P's research showed their top quintile of AS scores approximately corresponded to above 90%. So investors may believe that AS over 90% is a prerequisite for outperformance. Certainly an AS over 90% can be called high against almost any benchmark, but as we'll show, even a 90% AS can have very different meanings depending on the benchmark.

Subsequent research by C&P and various other entities has noted that AS varies significantly across differing universes, and varies most with capitalization. The argument has been made that the link between high AS and outperformance can be explained by other factors such as small cap bias, given that small cap portfolios tend to have significantly higher AS than larger cap portfolios.

[1] This report reflects a collaborative effort between SEB Investment Management (SEBIM) and the Brandes Institute. SEBIM, based in Stockholm, is one of the largest asset managers in Scandinavia and a subsidiary of SEB, a leading Nordic financial services group. Peter Branner, CEO of SEBIM, is a member of the Brandes Institute Advisory Board. Peter and colleagues Mark Rubin and Hakan Piscator partnered with Barry Gillman, Research Director, Brandes Institute Advisory Board, to conduct the research and analysis on this topic and to write this report.

[2] Active share is the percentage of a portfolio that is different than its benchmark index. It's calculated by taking the sum of the absolute value of the difference of the weight of each holding in the portfolio vs. the weight of each holding in the index and dividing by two.

[3] Cremers, Martijn and Petajisto, Antii. "How Active is Your Fund Manager? A New Measure That Predicts Performance." March 31, 2009. Available at SSRN.com: http://ssrn.com/abstract=891719 or http://dx.doi.org/10.2139/ssrn.891719

Our research shows that it is the specific benchmark that substantially defines the range of AS for portfolios managed against it. This leads us to provide a straightforward method for investors to evaluate the AS of any portfolio. Based on the construction of the benchmark, it is then possible to determine whether from a relative perspective AS can be viewed as high, low or somewhere in between, given the conditions imposed by that choice of benchmark index.

We also look at value for money in the context of what level of fees investors are paying for the level of AS. In theory one could argue that higher levels of AS should justify, or be associated with, higher fee levels. The original C&P work found little evidence to support this argument. With the ability to identify more appropriate peer groups to compare AS against fees, we can revisit the question of whether investors paying higher fees tend to get higher AS.

Background

The pioneering SEB Investment Management research on Expected Active Share ("EAS") was published in 2014. This used a database of European-registered mutual funds benchmarked primarily to Nordic and Eastern European indices, which are much more concentrated and have fewer constituents than most US or global indices (a small number of which were also included in the SEB Investment Management research). The impetus for this research was concern over the practical realities for active funds investing in these markets, in that large funds typically cannot take big positions in the relatively few securities with low benchmark weights due to size and liquidity constraints. This has led to an ongoing debate in Scandinavia between managers and regulators over the level of AS achievable by these funds and whether it is appropriate to impose a percentage threshold on AS for managers to be able to claim they are "active." That discussion is ongoing as of our date of publication.

For any index, an Expected Active Share can be calculated.

The SEB Investment Management research showed that the range of AS for funds benchmarked to any index was significantly correlated to the number of constituents and concentration of that index (defined in that paper as the percentage of the index represented by the largest ten stocks). Concentration and the number of constituents are also correlated, such that in general the more constituents, the lower the concentration. The paper demonstrated how, for any index, an Expected Active Share can be calculated, representing the median AS that would be expected for a universe of funds managed against that index.

The EAS for these concentrated Nordic and Eastern European indices was typically between 40% and 60%, demonstrating that it would be unusual to achieve AS much above 60% as an active manager against these benchmarks. Note: it would still be possible to achieve a high AS in such indices, well above the ranges cited here. However, this would most likely be feasible for portfolios that are small enough to avoid holding the large stocks that dominate the benchmark. In such a case, the portfolio would be likely to have a significant small cap tilt, and so the benchmark would be less relevant. Our research focuses on EAS, not "maximum AS," in order to represent the conditions under which most institutional investors operate.

The Brandes Institute and SEB Investment Management decided to build on this EAS research to examine a broader range of benchmarks and portfolios. The focus of this research is to apply the concept of EAS as a central point within a range of possible AS values, but one that is different for each benchmark. This approach can provide valuable insights into how best to use AS in evaluating active managers.

[4] Note that AS is simply a measure of how different a portfolio is from its benchmark. So in theory a high AS only demonstrates that a portfolio has a higher chance of outperforming or underperforming its benchmark than a portfolio with lower AS.

[5] Research related to this topic has been published by Fidelity Investments: "Active Share: A Misunderstood Measurement in Manager Selection," March 2014; AQR: "Deactivating Active Share," April 2015; MacQuarie Research: "Active Share: How High is High," February 6, 2015 and "Risky Business: Is High Active Share Always Good?" August 11, 2014; and Lazard Asset Management: "Taking a closer look at Active Share," June 25, 2014.

[6] "Expected Active Share: Models and Model Differences." SEB Investment Management presentation, Sept. 9, 2014.

The Database

The data needs for this research required information on the constituent stocks and weights in each index used, and the availability of a peer group of portfolios managed against each index for which each portfolio's Active Share was available or could be calculated.

The portfolios for which we had this data were mutual funds, with the underlying data sourced from Morningstar. A full description of the data used can be found in Appendix 3. In total the data includes 15 mutual fund peer groups with at least 20 funds, measured against 14 different indices (there were two peer groups for the S&P 500, one with 2013 data and one with 2014). Exhibit 1 lists these 15 peer groups, along with the top 10 concentration of each index and the observed median Active Share of each peer group. There were also five peer groups with less than 20 funds each, totaling 63 funds in these five peer groups; these are not included in Exhibit 1.

Exhibit 1: Fund /universe Peer Groups Ranked by Ascending Top 10 Concentration %

Index (2014 unless stated)	Concentration Top 10 as % Index	Peer Group Total # Funds	Median AS
MSCI ACWI	8.6%	71	89
MSCI ACWI ex US 2013	9.5%	26	87
MSCI World	9.6%	90	86
MSCI EAFE 2013	13.0%	52	77
S&P 500	17.5%	70	72
MSCI EM	17.6%	127	80
S&P 500 2013	18.1%	80	74
MSCI Europe	18.4%	138	71
MSCI AC Asia ex Japan	21.8%	60	76
MSCI Japan	21.8%	46	64
MSCI AC Far East ex Japan	23.9%	30	74
MSCI Latin America 10/40	35.6%	21	50
MSCI World Healthcare	39.4%	27	47
MSCI EM Europe	39.5%	26	47
S&P ASX 200	54.3%	46	44

Source: SEB Investment Management, Brandes Institute, June 2015

Predicting Expected Active Share

The goal of this research is to provide a framework so that investors can more effectively understand and evaluate Active Share for portfolios benchmarked to any index. We aim to provide a practical tool for investors to calculate the predicted median AS for any index, and then explain how to estimate a specific portfolio's AS rank among the universe of portfolios managed against that index.

The goal of this research is to provide a framework so that investors can more effectively understand and evaluate Active Share.

SEB Investment Management's original research identified two characteristics of an index that contribute to determining the EAS: the concentration (defined by the percentage of the largest ten stocks in each index), and the number of stocks included in that index. They found that concentration was the more dominant of the two measures, as it incorporates more relevant information. The two measures are correlated but not identical.

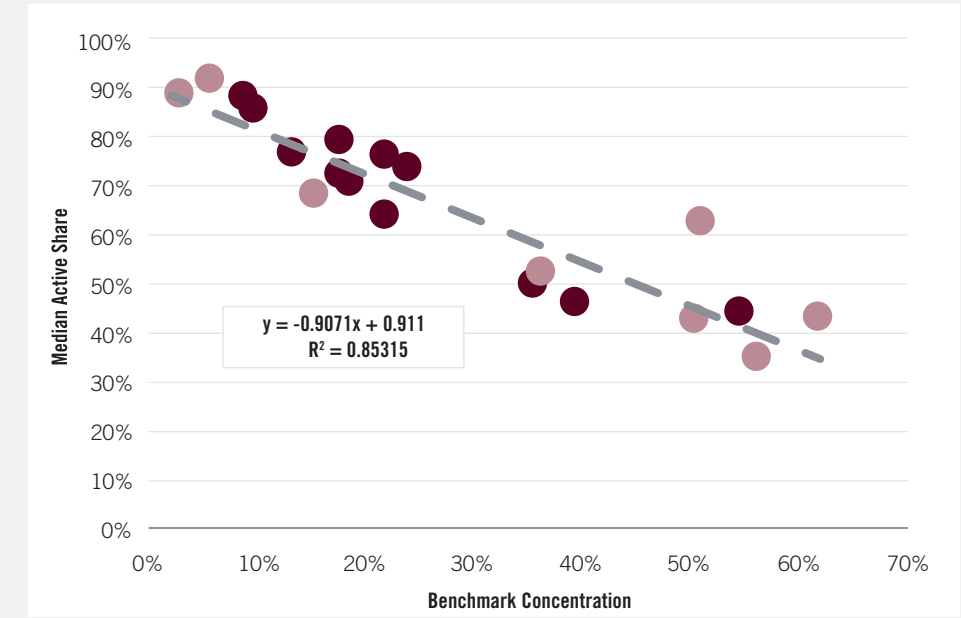
High benchmark concentration generally reflects an index structure dominated by a relatively small number of large market cap stocks with a (possibly significant) number of smaller stocks making up the balance of the index. For most mutual funds or institutional portfolios it may be difficult for liquidity reasons to take large positions in the smaller stocks in an index. Regulatory issues may also have an impact. In Europe for example, UCITS funds may not put more than 10% into one company. So for concentrated benchmarks that include stocks weighted close to, or above that 10% level, UCITS funds are not allowed to overweight those stocks. The only way they can achieve AS is by underweighting them. In practice this means that even for funds that try to make very active decisions in a mandate that confines them to a highly concentrated investment universe, there are significant limits to how high an AS they can achieve. This is the intuitive logic that the SEB Investment Management paper set out to analyze and document, concluding that every portfolio's AS has to be viewed in the context of its benchmark, and specifically that benchmark's concentration.

We continue this approach in this paper as this measure of index concentration is generally easily calculated and widely published. We use the top ten concentration in this research. Concentration using other numbers for the largest stocks was tested, including numbers for concentration between top 5 through top 20, but the correlation results were not materially different from those based on using the top ten concentration. A key determinant for selecting "top ten" however is the wide availability and use of "top ten" concentration in industry publications. The goal is to find a metric that not only works, but is easy to use by most investors, and use of top ten concentration meets both needs.

We start by examining 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. As shown in Exhibit 2, there is a strong relationship between the two measurements. The R-squared is 85% when including all 22 different indices for which we have peer group universes.

[7] There are 22 different indices in the study, of which 20 use yearend 2014 data and 2 (MSCI EAFE and MSCI ACWI ex US) use yearend 2013 data.

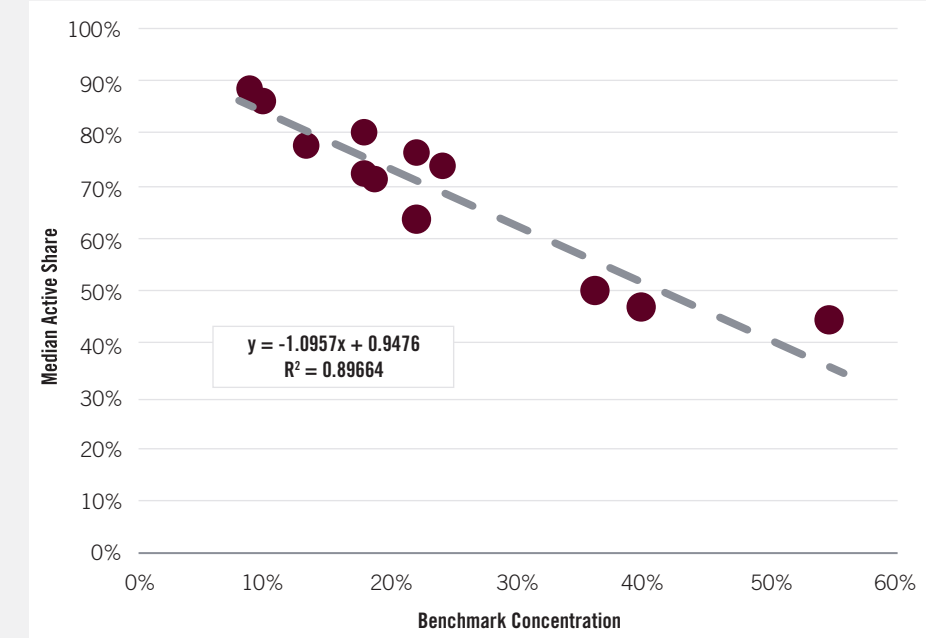
EXHIBIT 2: As Benchmark Concentration Increases, Active Share Tends to Fall
Observed relationship between median AS and benchmark concentration for 22 different benchmark



Source: SEB Investment Management, Brandes Institute, June 2015

If we limit the comparison only to those 14 indices where we have at least 20 funds in each peer group universe, the R-squared increases to 90%. *(Note: In Exhibit 2, the 14 plot points reflecting at least 20 funds are brown; the others are blue.)*

EXHIBIT 3: As Benchmark Concentration Increases, Active Share Tends to Fall
Only peer groups with at least 20 funds
Observed relationship between median AS and benchmark concentration for 14 different benchmarks



Source: SEB Investment Management, Brandes Institute, June 2015

Based on this observed data, the regression approach provides a formula for investors, such that given the top ten concentration of any index, it provides a prediction of the median of the peer group universe of portfolios managed against that index, which is the Expected Active Share "EAS." The formula for each regression is included in Exhibits 2 and 3. Note that because these are based on sets of empirical observations, the regression lines are not identical. Investors could use either formula, taking into account that relative to Exhibit 3, Exhibit 2 includes smaller sample sizes but more data on highly concentrated benchmarks.

In either case, we note the limitations of using a linear equation if concentration measures are extreme. However, the highest concentration among the indices we studied was in the low 60s (for the Russian index), and we do not expect many investors to use benchmarks with concentrations over 70%, for example. Given that the objective is to provide a practical tool for investors, we would merely share a reminder of the need for caution when using this as a predictive measure for extremely concentrated indices.

Concentration Coefficient: Even Stronger Predictive Ability

SEB Investment Management's original research noted that the number of constituents in a benchmark may also have relevance in predicting EAS, even though benchmark concentration tended to dominate the calculation. That was the reason we decided to focus solely on benchmark concentration in the prior sections. However, we decided to test whether using a metric that includes constituents would improve the predictive ability.

In previous work, dating back to 2004, the Brandes Institute had introduced the Concentration Coefficient ("CC"), which incorporates both concepts (benchmark weighting and number of constituents) in order to provide a more realistic metric of portfolio concentration. The CC of any portfolio or index is the inverse of the sum of the squares of the position weights. The CC of a portfolio can be thought of as the number of stocks in an equally weighted portfolio that has the same degree of concentration as the portfolio being measured. A full explanation of CC can be found in Appendix 1.

We found that a function of CC could provide an even better fit for the data than the use of the top ten concentration measure. Specifically, we used the inverse of the log function of CC in order to manage better the curvature in the data at the extremes of concentration. For example, for indices with very large numbers of constituents and low top 10 concentration, the typical AS scores are higher than a straight line top ten concentration regression would predict. Thus in Exhibit 2, plots at low concentration tend to be above the regression line. In practice this means that portfolios measured against these very diversified, unconcentrated indices will generally have AS scores well into the 90s, unless they deliberately aim to stay close to the index (as do some quant processes).

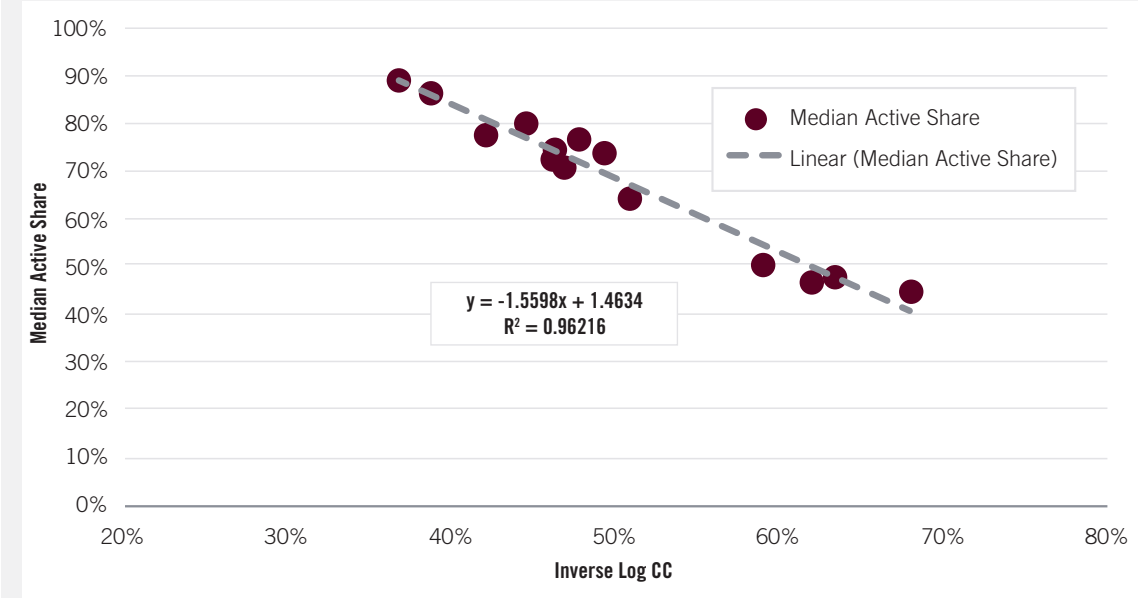
Exhibit 4 shows the results of using CC instead of top ten concentration in the regression against median AS. Using those 14 indices where we have at least 20 funds in each peer group universe, the R-squared increased from 90% to 96%.

The use of CC also provides a formula that can be used to predict median EAS. However, this assumes the user knows or can calculate the CC of the index for the peer group being studied. In Appendix 2, we list the CCs of some indices to assist in this effort, but in many situations, the investor would need to do the calculation, which requires a list of all index constituents and their weights in that index. As such we believe the CC regression approach will be of more use in theoretical research than as a practical tool for most investors. For most investors, we believe the simplicity, availability and intuitive nature of top ten concentration will be adequate for the purpose of estimating EAS for their chosen index.

EXHIBIT 4: As Benchmark Concentration Increases, Active Share Tends to Fall

Only peer groups with at least 20 funds

Observed relationship between median AS and Concentration Coefficient for 14 different benchmarks



Source: SEB Investment Management, Brandes Institute, June 2015

Using this observed data, our best predictor of EAS, i.e. the median for the peer group universe of portfolios managed against any index, is the regression equation from Exhibit 4.

EAS = -155.98/(ln CC) + 146.34

Using this "best predictor" formula, we can compare the observed median AS for these peer group universes with the predicted median, in Exhibit 5. Note that this is a confirmation of the prior observations, not an out-of-sample test.

EXHIBIT 5: Comparison of Observed Median AS and Predicted Median AS
Only peer groups with at least 20 funds

Benchmark	Median AS	Projected Median AS	Difference
MSCI ACWI	89	89	0
MSCI ACWI ex US 2013	87	86	0
MSCI World	86	86	0
MSCI EM	80	77	-3
MSCI EAFE 2013	77	81	3
MSCI AC Asia ex Japan	76	72	-5
S&P 500 2013	74	74	0
MSCI AC Far East ex Japan	74	69	-5
S&P 500	72	74	2
MSCI Europe	71	73	2
MSCI Japan	64	67	3
MSCI Latam 10/40	50	54	4
MSCI EM Europe	47	47	0
MSCI World Healthcare	47	50	3
S&P ASX 200	44	40	-4

Source: SEB Investment Management, Brandes Institute, June 2015

Dispersion around EAS

While EAS on its own is valuable information, equally important is an understanding of how far a portfolio's actual AS needs to be above or below the EAS for its peer group for it to be a true outlier. In practice, we believe the most useful way of measuring this is using quartile breaks, which are well understood and widely used in the investment industry.

We measured the distance of the first and third quartile breaks from median in each of the 15 peer group universes that had at least 20 fund constituents. These are shown in Exhibit 6. For universes with EAS in the highest ranges (i.e. over 90%) one would expect a compression of the first and second quartile as they push up to the 100% limit, possibly leading to an asymmetrical distribution between the first and third quartile breaks. However, the data showed a more symmetrical pattern.

EXHIBIT 6: Spread Between Median and First and Third Quartile Breaks of Observed AS
Only peer groups with at least 20 funds

Index (2014 unless stated) MEDIAN AS over 75	Median	1Q-Median	Median-3Q
MSCI ACWI	89	5	4
MSCI ACWI ex US 2013	87	3	4
MSCI World	86	6	9
MSCI EM	80	6	7
MSCI EAFE 2013	77	5	6
MSCI AC Asia ex Japan	76	5	7
Average Spread		**5**	**6**

MEDIAN below 75			
S&P 500 2013	74	8	12
MSCI AC Far East ex Japan	74	8	7
S&P 500	72	1-	14
MSCI Europe	71	8	9
MSCI Japan	64	8	14
MSCI Latam 10/40	50	9	4
MSCI EM Europe	47	15	7
MSCI World Healthcare	47	10	14
S&P ASX 200	44	9	8
Average Spread		**10**	**10**

Source: SEB Investment Management, Brandes Institute, June 2015

The first and third quartile breaks were generally symmetric around the median, while the compression effect was more evident for all universes where the EAS was above 75%.

The empirical observation is that in general, the first and third quartile breaks are 10 points away from the EAS, unless that EAS is above 75, in which case those breakpoints are closer to 5 points on either side of EAS.

Fees: Do Investors Pay More as AS Increases?

The short answer to the question of whether investors in higher AS portfolios pay higher fees is "not so much." As we noted in our Introduction to this paper, increasing AS just means the likelihood is greater that a portfolio will either materially outperform or underperform its index before fees. The symmetry is impacted by fees: if the under/over-performance chance of any portfolio was truly 50-50, then the outcome is skewed below 50-50 by the fees paid.

Academic research has shown some evidence that higher AS is associated with higher fees, but in these studies, as in ours, the link is weak. The original C&P study looked at fees charged in 2002 for the US mutual funds studied and concluded there was a relationship between fees and AS. The highest decile of AS were associated with the highest fees, and so on down the deciles. However the drop off in fee levels was not linear; funds with AS as low as 30% still charged fees closer to the higher AS deciles vs. index funds with AS below 10%, leading to criticism of these so-called "closet-indexers."

A more recent study by Cremers "et al" (2014 working paper) notes that more competitive markets where explicit index funds exist (e.g. the US) tend to produce better value-for-money in terms of the fees actually charged for a given level of active management (as defined by AS).

We revisit this topic in the light of knowing that the choice of benchmark index does set conditions and practical limitations for AS. This can make certain levels of AS share very hard to reach without driving liquidity risks and making the benchmark less relevant. For example, from a relative perspective, an AS of 60% with MSCI ACWI as benchmark can be seen as low, while the same AS for a portfolio benchmarked to a Canadian, Nordic or Australian index can be seen as high.

We show that the relationship between AS and fees appears quite weak.

In Exhibit 7, we show that the relationship between AS and fees appears quite weak, especially outside the United States. We measure the correlations between AS and fees for all the funds benchmarked to that index. These correlations are positive but are generally low. In practice it appears that AS plays little role in how fees are set.

EXHIBIT 7: Correlations Between Fee Levels and AS Are Positive But Generally Low

Index	# Funds	Median AS	Median Fee	Correlation of AS to Fee	Ratio of Median AS to Median Fee
US reg'd funds, end 2013					
MSCI ACWIxUS	26	87	0.85	19%	102%
MSCI EAFE	52	77	0.78	30%	99%
S&P 500	77	74	0.64	37%	116%
TOTAL	**155**				
European reg'd funds, end 2014					
MSCI ACWI	46	88	1.50	33%	59%
MSCI World	62	87	1.40	17%	62%
MSCI EM	86	80	1.50	27%	53%
MSCI AC Far East ex Japan	22	78	1.50	2%	52%
MSCI AC Asia ex Japan	45	77	1.50	7%	51%
S&P 500	58	72	1.50	10%	48%
MSCI Europe	102	69	1.50	25%	46%
MSCI World Healthcare	25	48	1.50	44%	32%
TOTAL	**446**				

Note: as explained below, using the ratio of median AS to median fee is not a true measure of "value-for-money" when compared across different benchmarks

Source: SEB Investment Management, Brandes Institute, Morningstar, June 2015. US registered fund fee data is as of July 31, 2014, and European registered fund data is as of June 2015. Fund universes were only included if they had a minimum of 20 funds.

Other observations from Exhibit 7 are:

• Fees on US registered funds are lower than European registered ones. This is not "new news," and reflects structural and competitive differences between the regional markets.

• The median fees across mandates for European-registered funds do not vary materially, while those for the US registered fund universe do vary, albeit in a sample of only three mandates.

We also show the ratio of median fee to median AS for each benchmarked universe. This is a simplistic measure of "value-for-money," which appears to show (for example) that the US registered funds benchmarked to the S&P500 seem to offer the best value-for-money, while among European-registered funds, the MSCI World universe appears to rank highest on the value-for-money scale. However, even leaving aside the already mentioned differences between fee levels in Europe and the United States, readers of this paper will by now know that the correct "value-for-money" comparison should not be made across different benchmarks as a management fee can be decomposed into two parts: cost of exposure and cost of active management.

Conclusion

Because Active Share is becoming a widely used measure, with a potential impact on decisions made by investors, it is increasingly important that it be well understood and used correctly. In this paper, we show that the construction of the benchmark index does set conditions and may impose practical limitations for AS. Therefore, from this relative perspective, there is no universal answer to whether a specific level of AS is high or low.

There is no universal answer to whether a specific level of AS is high or low.

We have developed SEB Investment Management's original work on Expected Active Share ("EAS") in a global context. For any benchmarked portfolio, EAS provides investors with a central estimate of the median AS for portfolios benchmarked to that index. We also provide data on the dispersion around that central estimate, so that investors may estimate into which quartile the AS of their portfolio is likely to fall.

The necessary and practical information needed to estimate EAS for any index is simply the top ten concentration of that index, which is generally easily available. We show that the correlation between that concentration measure and the median AS of benchmarked universe is over 90%, enabling a reliable prediction of EAS for any benchmark. The number of constituents in an index is additionally useful, and we show that Concentration Coefficient ("CC"), which uses both number and weights of constituents, can provide an even better prediction of EAS. However, the availability of data and complexity of the calculation may make CC more of a theoretical measure than a practical tool for investors.

We examined the relationship between AS and fees. While there was a positive correlation between AS and fees in each of the universes we analyzed, the correlation statistics were generally low, suggesting only a weak relationship between AS and fees.

We hope this research will help investors understand better how to interpret and use Active Share data, in order to make more informed decisions on their portfolios.

APPENDIX 1: The Concentration Coefficient

The Concentration Coefficient or CC is defined as the reciprocal of the sum of the squares of the weights of the holdings in a portfolio. This expresses portfolio concentration as the equivalent number of equal-weighted holdings.

Thus, the CC is defined as:

$$CC_t^P \equiv \left(\sum_{i=1}^{N} \left(w_{i,t}^P \right)^2 \right)^{-1}$$

where

P	is the portfolio
N	is the number of holdings held in the portfolio
$W_{i,t}$	is the weight of the ith holding in the portfolio at time t

The value of the CC will lie between 1 and the number of holdings in the portfolio. In practice, a portfolio that is relatively equal weighted will have a CC value that approaches its number of holdings. Conversely, the lower the CC, the more concentrated the portfolio.

The CC provides an intuitive measure of concentration that can be understood in the context of the conventional "number of holdings approach" used to indicate the degree of concentration. One application of this measure is to compare the CC to the number of holdings in a portfolio to illustrate the degree of "hidden" concentration. This affords an approach for evaluating specific portfolios as well as a basis for comparison across portfolios. For example, because of different weights for individual holdings, two portfolios with an identical number of holdings may have very different concentration profiles, as measured by the CC.

Note that the CC also can measure country and industry concentration by simply replacing holdings' weights with industry or country weights. Further, the calculation can be done for the equity only part of a portfolio, or if cash positions need to be taken into account, then cash could be treated as a single "position."

By definition, the CC offers a comprehensive definition of concentration. It can be applied to all types of portfolios and allows comparisons over time, against peers, and against indices.

APPENDIX 2: Concentration Coefficient for Selected Indices

The list below provides the Concentration Coefficient ("CC") for selected indices, including those mentioned elsewhere in this study. It is not intended to be a complete list, but to provide readers with illustrative background information on the range of CC values, as well as the CC of specific indices mentioned in this study.

All CC data is calculated as of yearend 2014, except for those indices marked (2013) where data is as of yearend 2013, and for the S&P ASX 200, where the data is as of November 25, 2014.

Benchmark	CC
Russell 2000	1013
MSCI ACWI	517
MSCI ACWI ex US	405
MSCI World	375
MSCI EAFE	245
Russell 1000	190
MSCI EM	174
S&P 500	148
MSCI Europe	135
MSCI AC Asia ex Japan	123
MSCI AC Far East ex Japan	106
MSCI Japan	92
CSX (2013)	61
SP TSX Canada	50
MSCI Latam 10/40	49
VINX (2013)	47
MSCI World Healthcare	41
MSCI EM Europe	37
SIXPRX (2013)	30
S&P ASX 200	29
MSCI World Info-Tech	23
OMX Helsinki (2013)	20
MSCI Russia 10/40	18

Source: Brandes Institute, July 2015

APPENDIX 3: Database and Methodology

The data needs for this research required information on the constituent stocks and weights in each index used, and the availability of a peer group of portfolios managed against each index for which each portfolio's Active Share was available or could be calculated.

The portfolios for which we had this data were mutual funds, with the underlying data sourced from Morningstar. There were two sets of mutual fund data used. The SEB Investment Management data set consisted of 866 European-registered mutual funds, with data recorded for 835 of them as of yearend 2014, and the others at yearend 2013.

The Brandes Institute data set consisted of 206 North American registered mutual funds. These were primarily US registered funds, plus 13 Canadian registered. The Canadian registered funds and 18 US small cap funds had data as of yearend 2014, and the other funds all were measured as of yearend 2013. The 2013 peer group data was made available for this research courtesy of Lazard Asset Management and the authors of the 2014 paper "*The Predictive Power of Portfolio Characteristics*," Gillman, Khusainova and Mier, who had sourced this data from Morningstar.

We acknowledge that it is not ideal to use data from different dates. However because our analysis focuses on the measurement and distribution of AS for a peer group against its benchmark, we believe it is relatively time-independent as long as measurements of each peer group and its matching index are carried out as of the same date, and the dates used are not widely different (in this case, one year apart). It may however be the case that these assumptions may not hold over a widely dispersed range of dates. Our analysis showed no significant variation in the conclusions on EAS regardless of time period, or whether the funds measured were European or North American registered.

Not all the data was used given that some peer groups were too small to have statistical meaning. A total of 944 funds were used, comprising 22 peer groups. We also limited some analysis to peer groups with a minimum of 20 funds. This universe comprised 830 funds in 14 peer groups.

[8] Weights for the Australian index, the S&P ASX 200 were only available as of November 25, 2014, so this data was used instead of yearend 2014

[9] Gillman, Barry and Khusainova, Erianna and Mier, Juan. "The Predictive Power of Portfolio Characteristics." December 2, 2014. Available at SSRN.com: http://ssrn.com/abstract=2539670 or http://dx.doi.org/10.2139/ssrn.2539670.

Disclosures

MSCI ACWI Index: The MSCI All Country World Index is a free float-adjusted market capitalization index that measures the equity market performance of developed and emerging markets.

MSCI ACWI ex U.S. Index: The MSCI All Country World ex-U.S. Index is a free float-adjusted market capitalization index that measures the equity market performance of developed and emerging markets excluding the United States.

MSCI World Index: The MSCI World Index is a free float-adjusted market capitalization index that measures the equity market performance of developed markets.

MSCI EAFE Index: The MSCI EAFE (Europe, Australasia, Far East) Index is a free float-adjusted market capitalization index that measures the equity market performance of developed markets in Europe, Australasia, and the Far East.

S&P 500 Index: The S&P 500 Index is a market capitalization index that measures the equity performance of 500 leading companies in industries of the U.S. economy.

MSCI Emerging Markets Index: The MSCI Emerging Markets Index is a free float-adjusted market capitalization index that measures the equity market performance of emerging markets.

MSCI Europe Index: The MSCI Europe Index is a free float-adjusted market capitalization index that measures the equity market performance of developed markets in Europe.

MSCI AC Asia Pacific ex Japan (ACAPACXJ) Index: The MSCI All Country Asia Pacific ex-Japan Index is a free float-adjusted market capitalization index that measures the equity market performance of the developed and emerging markets in the Asia Pacific region, excluding Japan.

MSCI Japan Index: The MSCI Japan Index is a free float-adjusted market capitalization index that measures the equity market performance in Japan.

MSCI AC Far East ex-Japan: The MSCI All Country Far East ex-Japan Index is a free float-adjusted market capitalization index that measures the equity market performance of the developed and emerging markets in the Far East region, excluding Japan.

MSCI Latin America 10/40 Index: The MSCI Latin America 10/40 Index is a free float-adjusted market capitalization index that measures the equity market performance of the Latin American markets. This index takes into consideration the 10% and 40% concentration constraints imposed on European-registered UCITS funds.

MSCI World Healthcare Index: The MSCI World Healthcare Index is a free float-adjusted market capitalization index that measures the developed market equity performance of the Health Care sector worldwide.

MSCI Emerging Markets Europe Index: The MSCI Emerging Markets Europe Index is a free float-adjusted market capitalization index that measures the equity market performance of emerging markets in Europe.

S&P ASX 200 Index: The S&P ASX 200 Index is a market capitalization index that measures the equity performance of 200 leading companies in Australia.

Correlation: Correlation is 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 coefficient 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. Past performance is not a guarantee of future results.

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